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(NASA-CN-161876) MODIFY THE JACCHIA MODEL
Final Report (Atsuko Computing
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FINAL REPORT

MODIFY THE JACCHIA MODEL

Prepared for:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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Attention:

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Under Contract:

NAS8-31004

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September 25, 1981



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1. INTRODUCTION

Atmospheric conditions encountered by a spacecraft in orbit about the Earth are important factors in space vehicle design, mission planning, and mission operations. Density is the primary atmospheric property that affects the spacecraft's orbital altitude, lifetime, and motion. Density as well as chemical composition and temperature are needed in calculating a spacecraft's drag coefficient.

Because of variability of atmospheric conditions with spatial location and solar activity, invariant models of the Earth's atmospheric (90 to 2500 km) would not be useful for most engineering applications. However, a computerized model developed by L.G. Jacchia in 1970, and revised in 1971 and 1977, incorporates variation with solar activities and spatial location. These Jacchia models can provide at selected times and locations estimates of:

- o density
- o composition
- o temperature
- o molecular mass
- o pressure scales height

for altitudes between 90 and 2500 km. Currently, NASA/MSFC Space Science Laboratory (SSL) is utilizing the Jacchia Models which reside on the MSFC UNIVAC 1108 computer.

Atsuko Computing International (ACI), personnel have aided NASA's research analysis by converting existing Jacchia Models from the UNIVAC 1108 to the SSL REEDA Computer System and enhancing the overall program capabilities. The Jacchia Models and the associated data bases reside on a REEDA System dedicated "JACCHIA" disc pack.

It is the intent of this report to be a working document which describes the Jacchia programs, explains how to operate them, and depicts the generated outputs. These Jacchia programs along with this document should now be of use to NASA personnel for continuing the Jacchia analysis effort.

2. TECHNICAL DISCUSSION

Currently, several JACCHIA Model programs exist and are being utilized by NASA/MSFC on the UNIVAC 1108 computer:

- o J70 -- New static models of the thermosphere and exosphere
- o J71 -- Revised static models of the thermosphere and exosphere
- o J77 -- New models of thermosphere temperature, density and composition.

These models essentially consist of two parts:

- 1) The basic static models, which give temperature and density profiles for the relevant atmospheric constituents for any specified exospheric temperature.
- 2) A set of formulae to compute the exosphere temperature and the expected deviations from the static models as a result of all recognized types of thermospheric variation.

Several types of variation are recognized in the atmospheric regions and covered by the JACCHIA Models:

- o Variations with the solar cycle
- o Variations with the daily change in activity on the solar disk
- o The diurnal variation
- o Variations with geomagnetic activity
- o The semi-annual variation
- o Seasonal-latitudinal variations of the lower thermosphere
- o Seasonal-latitudinal variations of helium
- o Rapid density fluctuations probably connected with gravity waves.

ACI's primary role in this effort was to convert existing Jacchia Models for the UNIVAC 1108 to the REEDA System. In addition, ACI modified and utilized various existing REEDA System data reduction programs to maximize the Jacchia Model program usefulness in predicting spacecraft orbital decay and lifetime. A sequence of events was performed by ACI during this effort to accomplish the above objective:

- o Converted the existing 1970 and 1971 Jacchia Models from the UNIVAC 1108 System to the REEDA System.

- o Modified the Jacchia Models to allow for various user inputs (via the HP terminal) to provide for interactive capability. This enhancement provides for a more generic application in the event that new requirements develop. This approach also reduces the program size by eliminating the redundancy and allowing the user to provide input decision criteria.
- o Modified various existing REEDA System programs to allow the use to take advantage of numerous data reduction capabilities for both statistical and graphic processing.

3. PROGRAM DESCRIPTION

Initially, the Jacchia Models converted from the UNIVAC 1108 to the REEDA System and the existing REEDA System programs that were modified and utilized were incorporated into what is termed the "JAC Series Programs". The JAC Series Programs are named sequentially JAC01 through JACXX. A brief description of the initial REEDA System Jacchia programs is as follows:

- o JAC01 -- REEDA System Version of UNIVAC 1108 Jacchia Model 70.
- o JAC02 -- REEDA System Version of UNIVAC 1108 Jacchia Model 71.
- o JAC03 -- REEDA System Version of UNIVAC 1108 Jacchia Model 77, (not implemented)
- o JAC04 -- Generates linear Log number density plots (N_2 , O_2 , O , HE , H , A) according to real-time user inputs for each Jacchia Model.
- o JAC05 -- Generates Log number "scatter" plots (N_2 , O_2 , O , HE , H , A) according to real-time user inputs for each Jacchia Model.
- o JAC06 -- Generates linear temperature plots according to real-time user inputs for each Jacchia Model.

Once the above programs were verified against the UNIVAC 1108 Models, ACI then implemented the user interaction capability and incorporated the above programs into the following three operational Jacchia programs:

- o JAC70 -- REEDA Ssystem User Interactive Jacchia 70 Model.
- o JAC71 -- REEDA System User Interactive Jacchia 71 Model
- o JPLOT -- REEDA System User Interactive Jacchia plot program.

In the remainder of this report, ACI will detail the JAC70, JAC71 and JPLOT programs. Appendix A, B, and C contain a complete FORTRAN source code listing of the above programs.

4. PROGRAM OPERATIONS

The JACCHIA programs reside on a dedicated REEDA System 7900 disc pack. The user must manually mount the JACCHIA disc pack in order to execute the JACCHIA programs.

Once the JACCHIA disc is mounted, the user should log-on using his assigned individual account name and password. At this point the user can process any of these programs:

- o JAC70 -- Jacchia 70 Model
- o JAC71 -- Jacchia 71 Model
- o JPLOT -- Jacchia Plot Program

To execute the above programs, the user can do so by using a special "transfer" file which replaces all ID segments, executes the desired program, and removes the ID segments when completed. The following transfer files will execute the desired program:

- o \JAC70 Jacchia 70 Model
- o \JAC71 Jacchia 71 Model
- o \JPLOT Jacchia Plot Program

To run a transfer file simply enter the following:

- o :\JAC70 "RETURN"

If the user desires to modify the existing programs, ACI has provided a special transfer file to purge the old load module, recompile program, and generate a new load module. The user can execute the following files for this purpose:

- o \CLJ70 Compute & Load Jacchia 70 Model
- o \CLJ71 Compute & Load Jacchia 71 Model
- o \CLJPL Compute & Load Jacchia Plot Program

A detailed example of the above transfer files is provided within Appendix E.

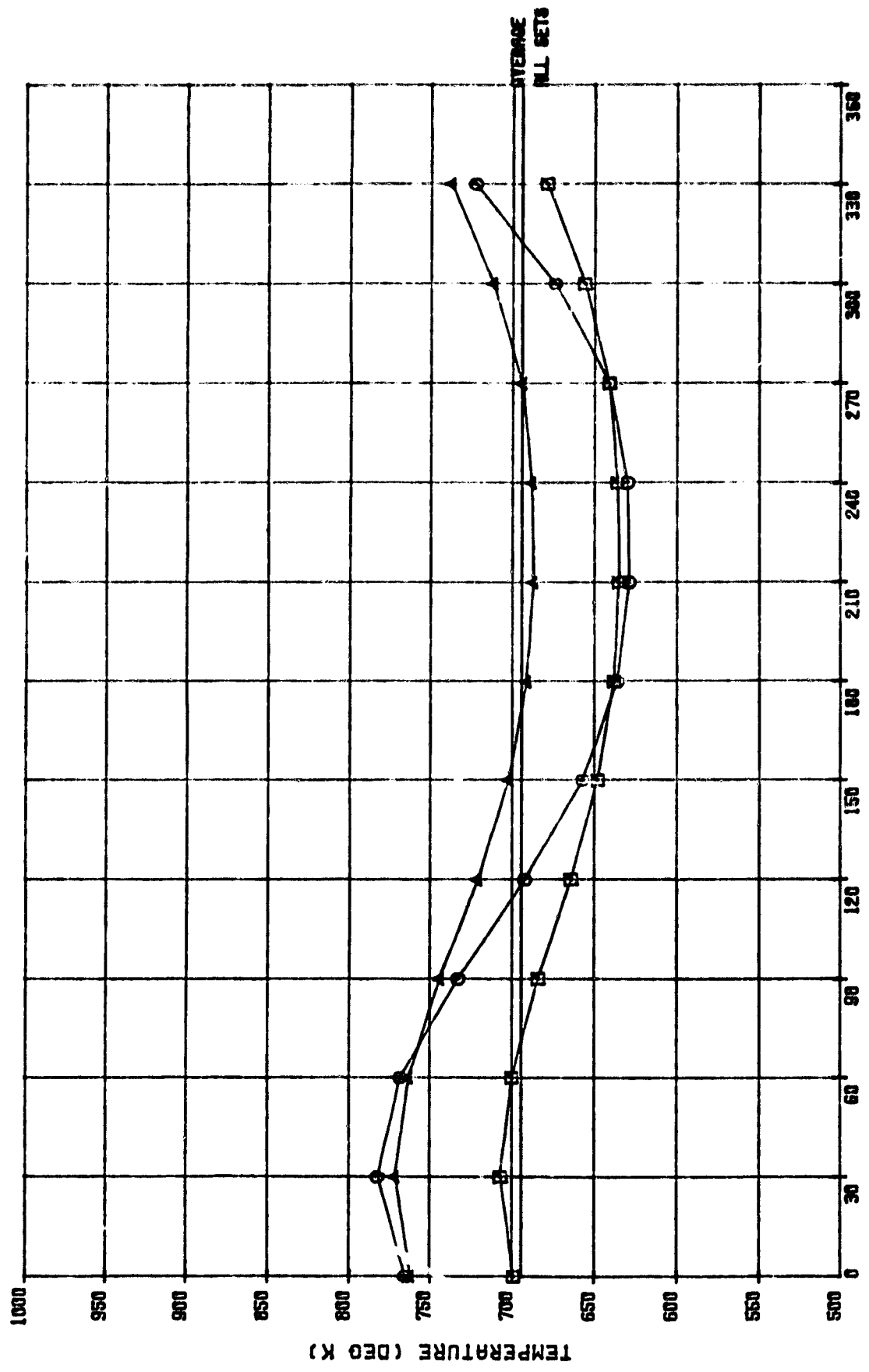
5. PROGRAM OUTPUTS

The JACCHIA programs generate various statistical and graphical outputs. This section depicts the following example outputs:

- o JAC70 Outputs
 - Densities (KG/M3)
 - Temperatures (Deg K)
 - N2
 - O2
 - O
 - A
 - HE
 - H
 - Mean Molecular Weight
 - Log Density (GM/CM3)
- o JAC71 Outputs
 - Temperatures (Deg K)
 - N2
 - O2
 - O
 - A
 - HE
 - H
 - Mean Molecular Weight
 - Log Density (GM/CM3)
- o JPLOT Outputs
 - Temperature Jacchia 70
 - Temperature Jacchia 71
 - Temperature Jacchia 70-vs-71

MODEL: JACCHIA 70
 PLOT: TEMPERATURE
 DATA: 6/20/68 12:00

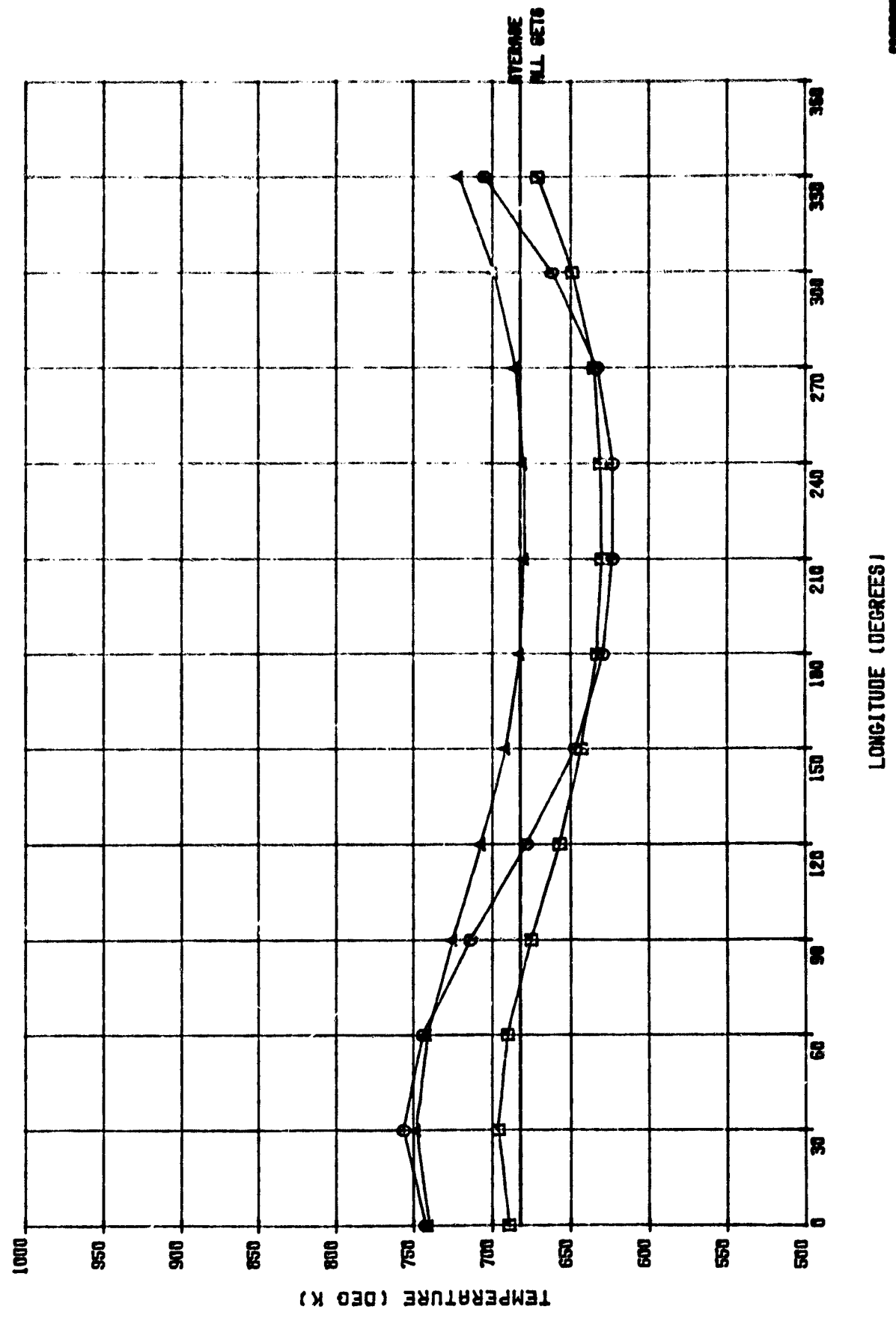
LEGEND
 □-- LATITUDE: -60
 ○-- LATITUDE: 0
 ▲-- LATITUDE: 60



LONGITUDE (DEGREES)

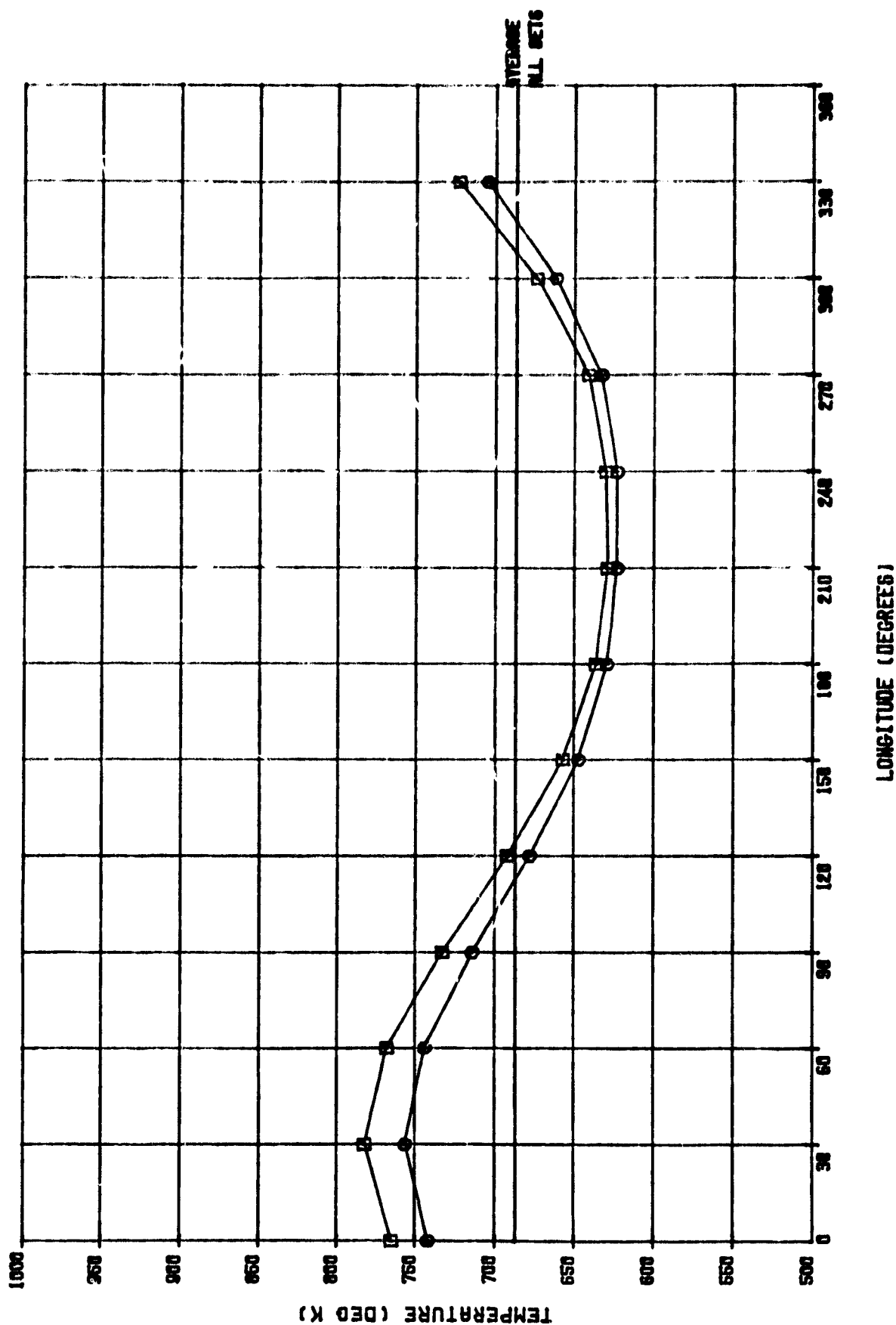
LEGEND
 □-- LATITUDE: -60
 ○-- LATITUDE: 0
 ▲-- LATITUDE: 60

MODEL: JACCHIA 71
 PLOT: TEMPERATURE
 DATA: 6/20/68 12:00



5- J70 LAT: 0
 6- J71 LAT: 0

MODEL: JACCHIA 70 -VS- JACCHIA 71
PLOT: TEMPERATURE
DATA: 6/20/68 12:00



4:13 PM MON.: 23 SEP.: 1961
 PENDING: 249.

[illegible]

) PROGRAM NAME: JAC70

) DATA FILE: JAC70D

) GEOMAG INDEX: 2

) JOURNAL INDEX: 3

DENSITIES (KG/M3)

PAGE 1

IR = 1969 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 (MJD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.341E-09	.352E-09	.363E-09	.376E-09	.388E-09	.400E-09	.411E-09
20.	.341E-09	.352E-09	.365E-09	.378E-09	.391E-09	.403E-09	.415E-09
30.	.341E-09	.353E-09	.366E-09	.379E-09	.392E-09	.404E-09	.416E-09
40.	.341E-09	.352E-09	.365E-09	.378E-09	.391E-09	.404E-09	.415E-09
50.	.341E-09	.352E-09	.364E-09	.376E-09	.389E-09	.401E-09	.412E-09
60.	.341E-09	.351E-09	.361E-09	.373E-09	.385E-09	.396E-09	.406E-09
70.	.341E-09	.349E-09	.359E-09	.369E-09	.379E-09	.390E-09	.399E-09
80.	.341E-09	.347E-09	.355E-09	.364E-09	.373E-09	.382E-09	.391E-09
90.	.341E-09	.345E-09	.351E-09	.358E-09	.366E-09	.374E-09	.382E-09
100.	.341E-09	.343E-09	.347E-09	.352E-09	.359E-09	.365E-09	.372E-09
110.	.341E-09	.341E-09	.343E-09	.347E-09	.351E-09	.356E-09	.362E-09
120.	.341E-09	.339E-09	.339E-09	.341E-09	.344E-09	.348E-09	.352E-09
130.	.341E-09	.337E-09	.336E-09	.335E-09	.337E-09	.339E-09	.342E-09
140.	.341E-09	.336E-09	.332E-09	.330E-09	.330E-09	.332E-09	.334E-09
150.	.341E-09	.334E-09	.329E-09	.326E-09	.325E-09	.325E-09	.326E-09
160.	.341E-09	.333E-09	.327E-09	.322E-09	.320E-09	.319E-09	.320E-09
170.	.341E-09	.332E-09	.325E-09	.319E-09	.316E-09	.315E-09	.315E-09
180.	.341E-09	.331E-09	.323E-09	.317E-09	.313E-09	.311E-09	.311E-09
190.	.341E-09	.331E-09	.322E-09	.316E-09	.311E-09	.309E-09	.308E-09
200.	.341E-09	.330E-09	.322E-09	.315E-09	.310E-09	.307E-09	.306E-09
210.	.341E-09	.330E-09	.321E-09	.314E-09	.310E-09	.307E-09	.306E-09
220.	.341E-09	.330E-09	.321E-09	.314E-09	.310E-09	.307E-09	.306E-09
230.	.341E-09	.330E-09	.321E-09	.314E-09	.310E-09	.307E-09	.306E-09
240.	.341E-09	.330E-09	.321E-09	.315E-09	.310E-09	.307E-09	.306E-09
250.	.341E-09	.330E-09	.322E-09	.315E-09	.311E-09	.308E-09	.307E-09
260.	.341E-09	.331E-09	.323E-09	.317E-09	.313E-09	.311E-09	.310E-09
270.	.341E-09	.332E-09	.325E-09	.319E-09	.316E-09	.315E-09	.315E-09
280.	.341E-09	.333E-09	.327E-09	.323E-09	.321E-09	.320E-09	.321E-09
290.	.341E-09	.335E-09	.330E-09	.328E-09	.327E-09	.328E-09	.329E-09
300.	.341E-09	.337E-09	.334E-09	.334E-09	.334E-09	.336E-09	.339E-09
310.	.341E-09	.339E-09	.339E-09	.340E-09	.343E-09	.347E-09	.351E-09
320.	.341E-09	.341E-09	.344E-09	.347E-09	.352E-09	.357E-09	.363E-09
330.	.341E-09	.344E-09	.348E-09	.354E-09	.361E-09	.368E-09	.375E-09
340.	.341E-09	.346E-09	.353E-09	.361E-09	.370E-09	.378E-09	.387E-09
350.	.341E-09	.348E-09	.357E-09	.367E-09	.377E-09	.387E-09	.397E-09
360.	.341E-09	.350E-09	.361E-09	.372E-09	.383E-09	.395E-09	.405E-09

ORIGINAL PAGE 13
 OF POOR QUALITY

DENSITIES (KG/M3)

PAGE 2

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)						
ON.	-20.	-10.	0.	10.	20.	30.	40.
(-WEST)							
(+EAST)							
10.	.420E-09	.428E-09	.434E-09	.438E-09	.440E-09	.440E-09	.438E-09
20.	.424E-09	.432E-09	.439E-09	.443E-09	.445E-09	.444E-09	.442E-09
30.	.426E-09	.434E-09	.440E-09	.444E-09	.446E-09	.446E-09	.443E-09
40.	.425E-09	.433E-09	.439E-09	.443E-09	.445E-09	.445E-09	.442E-09
50.	.421E-09	.429E-09	.435E-09	.439E-09	.441E-09	.441E-09	.439E-09
60.	.415E-09	.423E-09	.429E-09	.433E-09	.435E-09	.436E-09	.434E-09
70.	.408E-09	.415E-09	.421E-09	.425E-09	.428E-09	.428E-09	.428E-09
80.	.399E-09	.406E-09	.411E-09	.416E-09	.418E-09	.420E-09	.420E-09
90.	.389E-09	.395E-09	.401E-09	.405E-09	.408E-09	.410E-09	.411E-09
00.	.379E-09	.384E-09	.389E-09	.393E-09	.397E-09	.400E-09	.402E-09
10.	.368E-09	.373E-09	.377E-09	.381E-09	.385E-09	.389E-09	.392E-09
20.	.357E-09	.361E-09	.365E-09	.369E-09	.374E-09	.378E-09	.382E-09
30.	.346E-09	.350E-09	.354E-09	.358E-09	.363E-09	.368E-09	.373E-09
40.	.337E-09	.340E-09	.343E-09	.348E-09	.353E-09	.358E-09	.365E-09
50.	.328E-09	.331E-09	.334E-09	.338E-09	.343E-09	.350E-09	.357E-09
60.	.321E-09	.323E-09	.326E-09	.330E-09	.336E-09	.343E-09	.351E-09
70.	.315E-09	.317E-09	.319E-09	.324E-09	.329E-09	.337E-09	.346E-09
80.	.311E-09	.312E-09	.315E-09	.319E-09	.325E-09	.333E-09	.342E-09
90.	.308E-09	.309E-09	.311E-09	.316E-09	.322E-09	.330E-09	.340E-09
00.	.306E-09	.307E-09	.310E-09	.314E-09	.320E-09	.328E-09	.338E-09
10.	.306E-09	.306E-09	.309E-09	.313E-09	.319E-09	.327E-09	.337E-09
20.	.306E-09	.306E-09	.309E-09	.313E-09	.319E-09	.327E-09	.337E-09
30.	.306E-09	.306E-09	.309E-09	.313E-09	.319E-09	.327E-09	.337E-09
40.	.306E-09	.307E-09	.309E-09	.313E-09	.319E-09	.328E-09	.338E-09
50.	.308E-09	.308E-09	.311E-09	.315E-09	.321E-09	.329E-09	.339E-09
60.	.311E-09	.312E-09	.314E-09	.318E-09	.324E-09	.332E-09	.342E-09
70.	.315E-09	.317E-09	.320E-09	.324E-09	.330E-09	.337E-09	.346E-09
80.	.322E-09	.324E-09	.327E-09	.332E-09	.337E-09	.344E-09	.352E-09
90.	.332E-09	.334E-09	.338E-09	.342E-09	.347E-09	.353E-09	.360E-09
00.	.343E-09	.346E-09	.350E-09	.354E-09	.359E-09	.364E-09	.370E-09
10.	.355E-09	.359E-09	.364E-09	.368E-09	.372E-09	.377E-09	.381E-09
20.	.369E-09	.374E-09	.378E-09	.382E-09	.386E-09	.390E-09	.393E-09
30.	.382E-09	.386E-09	.393E-09	.397E-09	.400E-09	.403E-09	.404E-09
40.	.394E-09	.401E-09	.406E-09	.410E-09	.413E-09	.415E-09	.415E-09
50.	.405E-09	.412E-09	.418E-09	.422E-09	.425E-09	.426E-09	.425E-09
60.	.414E-09	.421E-09	.427E-09	.431E-09	.434E-09	.434E-09	.433E-09

DENSITIES (KG/M3)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440028. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 185.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)				
	50.	60.	70.	80.	90.
10.	.434E-09	.428E-09	.421E-09	.411E-09	.401E-09
20.	.437E-09	.431E-09	.422E-09	.412E-09	.401E-09
30.	.438E-09	.432E-09	.423E-09	.412E-09	.401E-09
40.	.437E-09	.431E-09	.422E-09	.412E-09	.401E-09
50.	.435E-09	.429E-09	.421E-09	.411E-09	.401E-09
60.	.431E-09	.425E-09	.418E-09	.410E-09	.401E-09
70.	.425E-09	.421E-09	.415E-09	.408E-09	.401E-09
80.	.418E-09	.416E-09	.412E-09	.407E-09	.401E-09
90.	.411E-09	.410E-09	.407E-09	.404E-09	.401E-09
100.	.403E-09	.403E-09	.403E-09	.402E-09	.401E-09
110.	.395E-09	.397E-09	.399E-09	.400E-09	.401E-09
120.	.387E-09	.391E-09	.394E-09	.398E-09	.401E-09
130.	.379E-09	.385E-09	.390E-09	.396E-09	.401E-09
140.	.372E-09	.379E-09	.387E-09	.394E-09	.401E-09
150.	.366E-09	.374E-09	.383E-09	.392E-09	.401E-09
160.	.360E-09	.370E-09	.381E-09	.391E-09	.401E-09
170.	.356E-09	.367E-09	.378E-09	.390E-09	.401E-09
180.	.353E-09	.365E-09	.377E-09	.389E-09	.401E-09
190.	.351E-09	.363E-09	.376E-09	.388E-09	.401E-09
200.	.350E-09	.362E-09	.375E-09	.388E-09	.401E-09
210.	.349E-09	.362E-09	.375E-09	.388E-09	.401E-09
220.	.349E-09	.362E-09	.375E-09	.388E-09	.401E-09
230.	.349E-09	.362E-09	.375E-09	.388E-09	.401E-09
240.	.349E-09	.362E-09	.375E-09	.388E-09	.401E-09
250.	.350E-09	.363E-09	.376E-09	.388E-09	.401E-09
260.	.353E-09	.364E-09	.377E-09	.389E-09	.401E-09
270.	.356E-09	.367E-09	.378E-09	.390E-09	.401E-09
280.	.361E-09	.371E-09	.381E-09	.391E-09	.401E-09
290.	.368E-09	.376E-09	.385E-09	.393E-09	.401E-09
300.	.376E-09	.383E-09	.389E-09	.395E-09	.401E-09
310.	.386E-09	.390E-09	.394E-09	.398E-09	.401E-09
320.	.395E-09	.398E-09	.399E-09	.400E-09	.401E-09
330.	.405E-09	.405E-09	.404E-09	.403E-09	.401E-09
340.	.415E-09	.413E-09	.410E-09	.406E-09	.401E-09
350.	.423E-09	.419E-09	.414E-09	.408E-09	.401E-09
360.	.429E-09	.424E-09	.418E-09	.410E-09	.401E-09

TEMP. DEG. K

PAGE

YR = 1969 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440026. F10 = 100.00 F108 = 100.00 GI = 0.00
 ALTITUDE = 185.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-90.	-80.	-70.	-60.	-50.	-40.	-30.
10.	.664E+03	.676E+03	.690E+03	.704E+03	.718E+03	.732E+03	.745E+03
20.	.664E+03	.677E+03	.691E+03	.706E+03	.721E+03	.736E+03	.750E+03
30.	.664E+03	.677E+03	.692E+03	.707E+03	.723E+03	.737E+03	.751E+03
40.	.664E+03	.677E+03	.691E+03	.706E+03	.722E+03	.736E+03	.750E+03
50.	.664E+03	.676E+03	.690E+03	.704E+03	.719E+03	.733E+03	.746E+03
60.	.664E+03	.675E+03	.687E+03	.700E+03	.714E+03	.727E+03	.740E+03
70.	.664E+03	.673E+03	.684E+03	.696E+03	.708E+03	.720E+03	.731E+03
80.	.664E+03	.671E+03	.680E+03	.690E+03	.701E+03	.711E+03	.722E+03
90.	.664E+03	.669E+03	.676E+03	.684E+03	.693E+03	.702E+03	.711E+03
100.	.664E+03	.667E+03	.671E+03	.677E+03	.684E+03	.692E+03	.700E+03
110.	.664E+03	.665E+03	.667E+03	.671E+03	.676E+03	.682E+03	.688E+03
120.	.664E+03	.662E+03	.662E+03	.664E+03	.667E+03	.672E+03	.677E+03
130.	.664E+03	.660E+03	.658E+03	.658E+03	.660E+03	.663E+03	.666E+03
140.	.664E+03	.658E+03	.655E+03	.653E+03	.653E+03	.654E+03	.657E+03
150.	.664E+03	.657E+03	.651E+03	.648E+03	.646E+03	.647E+03	.648E+03
160.	.664E+03	.655E+03	.649E+03	.644E+03	.641E+03	.640E+03	.641E+03
170.	.664E+03	.654E+03	.646E+03	.641E+03	.637E+03	.635E+03	.635E+03
180.	.664E+03	.653E+03	.645E+03	.638E+03	.634E+03	.632E+03	.631E+03
190.	.664E+03	.653E+03	.644E+03	.637E+03	.632E+03	.629E+03	.628E+03
200.	.664E+03	.653E+03	.643E+03	.636E+03	.631E+03	.629E+03	.627E+03
210.	.664E+03	.652E+03	.643E+03	.635E+03	.630E+03	.627E+03	.626E+03
220.	.664E+03	.652E+03	.643E+03	.635E+03	.630E+03	.627E+03	.626E+03
230.	.664E+03	.652E+03	.643E+03	.635E+03	.630E+03	.627E+03	.626E+03
240.	.664E+03	.653E+03	.643E+03	.636E+03	.630E+03	.628E+03	.626E+03
250.	.664E+03	.653E+03	.643E+03	.636E+03	.632E+03	.629E+03	.628E+03
260.	.664E+03	.653E+03	.645E+03	.638E+03	.634E+03	.631E+03	.631E+03
270.	.664E+03	.654E+03	.646E+03	.641E+03	.637E+03	.636E+03	.635E+03
280.	.664E+03	.656E+03	.649E+03	.645E+03	.642E+03	.642E+03	.642E+03
290.	.664E+03	.657E+03	.653E+03	.650E+03	.649E+03	.650E+03	.652E+03
300.	.664E+03	.660E+03	.657E+03	.656E+03	.657E+03	.659E+03	.663E+03
310.	.664E+03	.662E+03	.662E+03	.663E+03	.666E+03	.671E+03	.675E+03
320.	.664E+03	.665E+03	.667E+03	.671E+03	.676E+03	.683E+03	.689E+03
330.	.664E+03	.668E+03	.673E+03	.679E+03	.687E+03	.695E+03	.703E+03
340.	.664E+03	.670E+03	.678E+03	.687E+03	.696E+03	.706E+03	.716E+03
350.	.664E+03	.673E+03	.683E+03	.694E+03	.705E+03	.717E+03	.728E+03
360.	.664E+03	.675E+03	.687E+03	.699E+03	.713E+03	.726E+03	.738E+03

TEMP. DEG. K

PAGE 2

YR = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440020. F10 = 100.00 F108 = 100.00 G1 = 0.00
 ALTITUDE = 105.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.757E+03	.767E+03	.774E+03	.780E+03	.782E+03	.782E+03	.779E+03
20.	.762E+03	.772E+03	.780E+03	.785E+03	.787E+03	.787E+03	.784E+03
30.	.763E+03	.774E+03	.782E+03	.787E+03	.789E+03	.789E+03	.785E+03
40.	.762E+03	.772E+03	.780E+03	.785E+03	.788E+03	.787E+03	.784E+03
50.	.758E+03	.768E+03	.775E+03	.780E+03	.783E+03	.783E+03	.780E+03
60.	.751E+03	.760E+03	.768E+03	.773E+03	.776E+03	.776E+03	.774E+03
70.	.742E+03	.751E+03	.758E+03	.763E+03	.766E+03	.767E+03	.766E+03
80.	.731E+03	.739E+03	.746E+03	.751E+03	.754E+03	.756E+03	.756E+03
90.	.719E+03	.727E+03	.733E+03	.738E+03	.742E+03	.744E+03	.745E+03
100.	.707E+03	.713E+03	.719E+03	.724E+03	.728E+03	.732E+03	.734E+03
110.	.694E+03	.700E+03	.705E+03	.710E+03	.715E+03	.719E+03	.723E+03
120.	.682E+03	.687E+03	.692E+03	.696E+03	.701E+03	.706E+03	.711E+03
130.	.670E+03	.674E+03	.677E+03	.683E+03	.689E+03	.695E+03	.701E+03
140.	.660E+03	.663E+03	.667E+03	.672E+03	.677E+03	.684E+03	.691E+03
150.	.650E+03	.653E+03	.657E+03	.661E+03	.667E+03	.674E+03	.683E+03
160.	.643E+03	.645E+03	.648E+03	.652E+03	.659E+03	.666E+03	.676E+03
170.	.636E+03	.638E+03	.641E+03	.645E+03	.652E+03	.660E+03	.670E+03
180.	.632E+03	.633E+03	.636E+03	.640E+03	.647E+03	.655E+03	.666E+03
190.	.626E+03	.629E+03	.632E+03	.637E+03	.643E+03	.652E+03	.663E+03
200.	.627E+03	.628E+03	.630E+03	.634E+03	.641E+03	.650E+03	.661E+03
210.	.626E+03	.627E+03	.629E+03	.634E+03	.640E+03	.649E+03	.660E+03
220.	.626E+03	.627E+03	.629E+03	.633E+03	.640E+03	.649E+03	.660E+03
230.	.626E+03	.627E+03	.629E+03	.633E+03	.640E+03	.649E+03	.660E+03
240.	.626E+03	.627E+03	.630E+03	.634E+03	.641E+03	.650E+03	.661E+03
250.	.628E+03	.629E+03	.631E+03	.636E+03	.642E+03	.651E+03	.662E+03
260.	.631E+03	.632E+03	.635E+03	.639E+03	.646E+03	.655E+03	.665E+03
270.	.636E+03	.638E+03	.641E+03	.645E+03	.652E+03	.660E+03	.670E+03
280.	.644E+03	.646E+03	.649E+03	.654E+03	.660E+03	.668E+03	.677E+03
290.	.654E+03	.657E+03	.661E+03	.665E+03	.671E+03	.678E+03	.686E+03
300.	.666E+03	.670E+03	.674E+03	.679E+03	.684E+03	.691E+03	.697E+03
310.	.680E+03	.685E+03	.690E+03	.695E+03	.700E+03	.705E+03	.710E+03
320.	.695E+03	.701E+03	.706E+03	.711E+03	.716E+03	.720E+03	.724E+03
330.	.711E+03	.717E+03	.723E+03	.728E+03	.732E+03	.735E+03	.737E+03
340.	.725E+03	.733E+03	.739E+03	.744E+03	.748E+03	.750E+03	.751E+03
350.	.738E+03	.747E+03	.754E+03	.759E+03	.762E+03	.763E+03	.762E+03
360.	.749E+03	.758E+03	.765E+03	.771E+03	.774E+03	.774E+03	.772E+03

TEMP. DEG. K

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YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 *MJD = 2440028. F10 = 100.00 F10B = 100.00 G1 = 0 00
 ALTITUDE = 185.0

CON.	(-SOUTH) LATITUDES (+NORTH)				
(-WEST)	50.	60.	70.	80.	90.
(+EAST)					
10.	.774E+03	.767E+03	.757E+03	.746E+03	.733E+03
20.	.778E+03	.770E+03	.759E+03	.747E+03	.733E+03
30.	.779E+03	.771E+03	.760E+03	.747E+03	.733E+03
40.	.778E+03	.770E+03	.759E+03	.747E+03	.733E+03
50.	.775E+03	.767E+03	.757E+03	.746E+03	.733E+03
60.	.770E+03	.763E+03	.754E+03	.744E+03	.733E+03
70.	.762E+03	.757E+03	.751E+03	.742E+03	.733E+03
80.	.754E+03	.751E+03	.746E+03	.740E+03	.733E+03
90.	.745E+03	.744E+03	.741E+03	.737E+03	.733E+03
100.	.735E+03	.736E+03	.736E+03	.735E+03	.733E+03
110.	.726E+03	.728E+03	.731E+03	.732E+03	.733E+03
120.	.716E+03	.721E+03	.725E+03	.729E+03	.733E+03
130.	.707E+03	.714E+03	.721E+03	.727E+03	.733E+03
140.	.699E+03	.708E+03	.716E+03	.725E+03	.733E+03
150.	.692E+03	.702E+03	.713E+03	.723E+03	.733E+03
160.	.686E+03	.697E+03	.709E+03	.721E+03	.733E+03
170.	.681E+03	.694E+03	.707E+03	.720E+03	.733E+03
180.	.678E+03	.691E+03	.705E+03	.719E+03	.733E+03
190.	.675E+03	.689E+03	.704E+03	.718E+03	.733E+03
200.	.674E+03	.688E+03	.703E+03	.718E+03	.733E+03
210.	.673E+03	.687E+03	.703E+03	.718E+03	.733E+03
220.	.673E+03	.687E+03	.702E+03	.718E+03	.733E+03
230.	.673E+03	.687E+03	.702E+03	.718E+03	.733E+03
240.	.674E+03	.688E+03	.703E+03	.718E+03	.733E+03
250.	.675E+03	.689E+03	.703E+03	.718E+03	.733E+03
260.	.677E+03	.691E+03	.705E+03	.719E+03	.733E+03
270.	.681E+03	.694E+03	.707E+03	.720E+03	.733E+03
280.	.687E+03	.698E+03	.710E+03	.722E+03	.733E+03
290.	.695E+03	.704E+03	.714E+03	.724E+03	.733E+03
300.	.704E+03	.712E+03	.719E+03	.726E+03	.733E+03
310.	.715E+03	.720E+03	.725E+03	.729E+03	.733E+03
320.	.727E+03	.729E+03	.731E+03	.732E+03	.733E+03
330.	.738E+03	.738E+03	.737E+03	.736E+03	.733E+03
340.	.750E+03	.747E+03	.743E+03	.739E+03	.733E+03
350.	.760E+03	.755E+03	.749E+03	.741E+03	.733E+03
360.	.768E+03	.762E+03	.754E+03	.744E+03	.733E+03

(N2)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 (MJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 195.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.960E+01	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	.970E+01
20.	.960E+01	.962E+01	.964E+01	.965E+01	.967E+01	.969E+01	.971E+01
30.	.960E+01	.962E+01	.964E+01	.966E+01	.968E+01	.969E+01	.971E+01
40.	.960E+01	.962E+01	.964E+01	.966E+01	.967E+01	.969E+01	.971E+01
50.	.960E+01	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	.970E+01
60.	.960E+01	.961E+01	.963E+01	.965E+01	.966E+01	.968E+01	.970E+01
70.	.960E+01	.961E+01	.963E+01	.964E+01	.966E+01	.967E+01	.969E+01
80.	.960E+01	.961E+01	.962E+01	.963E+01	.965E+01	.966E+01	.967E+01
90.	.960E+01	.960E+01	.961E+01	.962E+01	.964E+01	.965E+01	.966E+01
100.	.960E+01	.960E+01	.961E+01	.962E+01	.963E+01	.964E+01	.965E+01
110.	.960E+01	.960E+01	.960E+01	.961E+01	.961E+01	.962E+01	.963E+01
120.	.960E+01	.959E+01	.959E+01	.960E+01	.960E+01	.961E+01	.962E+01
130.	.960E+01	.959E+01	.959E+01	.959E+01	.959E+01	.959E+01	.960E+01
140.	.960E+01	.959E+01	.958E+01	.958E+01	.958E+01	.958E+01	.959E+01
150.	.960E+01	.959E+01	.958E+01	.957E+01	.957E+01	.957E+01	.957E+01
160.	.960E+01	.958E+01	.957E+01	.957E+01	.956E+01	.956E+01	.956E+01
170.	.960E+01	.958E+01	.957E+01	.956E+01	.955E+01	.955E+01	.955E+01
180.	.960E+01	.958E+01	.957E+01	.956E+01	.955E+01	.955E+01	.954E+01
190.	.960E+01	.958E+01	.956E+01	.955E+01	.955E+01	.954E+01	.954E+01
200.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
210.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
220.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
230.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
240.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
250.	.960E+01	.958E+01	.956E+01	.955E+01	.954E+01	.954E+01	.954E+01
260.	.960E+01	.958E+01	.957E+01	.956E+01	.955E+01	.954E+01	.954E+01
270.	.960E+01	.958E+01	.957E+01	.956E+01	.955E+01	.955E+01	.955E+01
280.	.960E+01	.958E+01	.957E+01	.957E+01	.956E+01	.956E+01	.956E+01
290.	.960E+01	.959E+01	.958E+01	.957E+01	.957E+01	.957E+01	.958E+01
300.	.960E+01	.959E+01	.959E+01	.958E+01	.959E+01	.959E+01	.959E+01
310.	.960E+01	.959E+01	.959E+01	.960E+01	.960E+01	.961E+01	.961E+01
320.	.960E+01	.960E+01	.960E+01	.961E+01	.961E+01	.962E+01	.963E+01
330.	.960E+01	.960E+01	.961E+01	.962E+01	.963E+01	.964E+01	.965E+01
340.	.960E+01	.961E+01	.962E+01	.963E+01	.964E+01	.966E+01	.967E+01
350.	.960E+01	.961E+01	.962E+01	.964E+01	.965E+01	.967E+01	.968E+01
360.	.960E+01	.961E+01	.963E+01	.965E+01	.966E+01	.968E+01	.969E+01

(N2)

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R = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440026. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)						
ON.	-20.	-10.	0.	10.	20.	30.	40.
-WEST)							
+EAST)							
10.	.971E+01	.972E+01	.973E+01	.974E+01	.974E+01	.974E+01	.974E+01
20.	.972E+01	.973E+01	.974E+01	.974E+01	.974E+01	.974E+01	.974E+01
30.	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01	.975E+01	.974E+01
40.	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01	.974E+01	.974E+01
50.	.971E+01	.973E+01	.973E+01	.974E+01	.974E+01	.974E+01	.974E+01
60.	.971E+01	.972E+01	.973E+01	.973E+01	.973E+01	.973E+01	.973E+01
70.	.970E+01	.971E+01	.971E+01	.972E+01	.972E+01	.972E+01	.972E+01
80.	.969E+01	.969E+01	.970E+01	.971E+01	.971E+01	.971E+01	.971E+01
90.	.967E+01	.968E+01	.969E+01	.969E+01	.970E+01	.970E+01	.970E+01
100.	.966E+01	.966E+01	.967E+01	.968E+01	.968E+01	.969E+01	.969E+01
110.	.964E+01	.965E+01	.965E+01	.966E+01	.967E+01	.967E+01	.968E+01
120.	.962E+01	.963E+01	.964E+01	.964E+01	.965E+01	.965E+01	.966E+01
130.	.961E+01	.961E+01	.962E+01	.962E+01	.963E+01	.964E+01	.965E+01
140.	.959E+01	.959E+01	.960E+01	.961E+01	.962E+01	.962E+01	.964E+01
150.	.958E+01	.958E+01	.959E+01	.959E+01	.960E+01	.961E+01	.962E+01
160.	.956E+01	.957E+01	.957E+01	.958E+01	.959E+01	.960E+01	.961E+01
170.	.955E+01	.956E+01	.956E+01	.957E+01	.958E+01	.959E+01	.961E+01
180.	.954E+01	.955E+01	.955E+01	.956E+01	.957E+01	.958E+01	.960E+01
190.	.954E+01	.954E+01	.955E+01	.955E+01	.956E+01	.958E+01	.959E+01
200.	.954E+01	.954E+01	.954E+01	.955E+01	.956E+01	.958E+01	.959E+01
210.	.954E+01	.954E+01	.954E+01	.955E+01	.956E+01	.957E+01	.959E+01
220.	.953E+01	.954E+01	.954E+01	.955E+01	.956E+01	.957E+01	.959E+01
230.	.953E+01	.954E+01	.954E+01	.955E+01	.956E+01	.957E+01	.959E+01
240.	.954E+01	.954E+01	.954E+01	.955E+01	.956E+01	.957E+01	.959E+01
250.	.954E+01	.954E+01	.954E+01	.955E+01	.956E+01	.958E+01	.959E+01
260.	.954E+01	.955E+01	.955E+01	.956E+01	.957E+01	.958E+01	.960E+01
270.	.955E+01	.956E+01	.956E+01	.957E+01	.958E+01	.959E+01	.961E+01
280.	.957E+01	.957E+01	.957E+01	.958E+01	.959E+01	.960E+01	.962E+01
290.	.958E+01	.959E+01	.959E+01	.960E+01	.961E+01	.962E+01	.963E+01
300.	.960E+01	.961E+01	.961E+01	.962E+01	.963E+01	.963E+01	.964E+01
310.	.962E+01	.963E+01	.963E+01	.964E+01	.965E+01	.965E+01	.966E+01
320.	.964E+01	.965E+01	.966E+01	.966E+01	.967E+01	.967E+01	.968E+01
330.	.966E+01	.967E+01	.968E+01	.968E+01	.969E+01	.969E+01	.969E+01
340.	.968E+01	.969E+01	.969E+01	.970E+01	.970E+01	.971E+01	.971E+01
350.	.969E+01	.970E+01	.971E+01	.972E+01	.972E+01	.972E+01	.972E+01
360.	.971E+01	.972E+01	.972E+01	.973E+01	.973E+01	.973E+01	.973E+01

(N2)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
XNJD = 2440020. F10 = 100.00 F100 = 100.00 GI = 0.00
ALTITUDE = 165.0

LONG.	50.	60.	(-SOUTH) LATITUDES (+NORTH)	70.	80.	90.
(-WEST)						
(+EAST)						
10.	.973E+01	.972E+01	.971E+01	.970E+01	.969E+01	
20.	.974E+01	.973E+01	.972E+01	.970E+01	.969E+01	
30.	.974E+01	.973E+01	.972E+01	.970E+01	.969E+01	
40.	.974E+01	.973E+01	.972E+01	.970E+01	.969E+01	
50.	.973E+01	.972E+01	.971E+01	.970E+01	.969E+01	
60.	.973E+01	.972E+01	.971E+01	.970E+01	.969E+01	
70.	.972E+01	.971E+01	.971E+01	.970E+01	.969E+01	
80.	.971E+01	.971E+01	.970E+01	.970E+01	.969E+01	
90.	.970E+01	.970E+01	.970E+01	.969E+01	.969E+01	
100.	.969E+01	.969E+01	.969E+01	.969E+01	.969E+01	
110.	.968E+01	.968E+01	.968E+01	.969E+01	.969E+01	
120.	.967E+01	.967E+01	.968E+01	.968E+01	.969E+01	
130.	.966E+01	.966E+01	.967E+01	.968E+01	.969E+01	
140.	.965E+01	.966E+01	.967E+01	.968E+01	.969E+01	
150.	.964E+01	.965E+01	.966E+01	.968E+01	.969E+01	
160.	.963E+01	.964E+01	.966E+01	.967E+01	.969E+01	
170.	.962E+01	.964E+01	.966E+01	.967E+01	.969E+01	
180.	.962E+01	.963E+01	.965E+01	.967E+01	.969E+01	
190.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
200.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
210.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
220.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
230.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
240.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
250.	.961E+01	.963E+01	.965E+01	.967E+01	.969E+01	
260.	.962E+01	.963E+01	.965E+01	.967E+01	.969E+01	
270.	.962E+01	.964E+01	.966E+01	.967E+01	.969E+01	
280.	.963E+01	.964E+01	.966E+01	.967E+01	.969E+01	
290.	.964E+01	.965E+01	.966E+01	.968E+01	.969E+01	
300.	.965E+01	.966E+01	.967E+01	.968E+01	.969E+01	
310.	.967E+01	.967E+01	.968E+01	.968E+01	.969E+01	
320.	.968E+01	.968E+01	.969E+01	.969E+01	.969E+01	
330.	.969E+01	.969E+01	.969E+01	.969E+01	.969E+01	
340.	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	
350.	.972E+01	.971E+01	.971E+01	.970E+01	.969E+01	
360.	.973E+01	.972E+01	.971E+01	.970E+01	.969E+01	

(02)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XNJD = 2440020. F10 = 100.00 F10B = 100.00 CI = 0.00
 ALTITUDE = 105.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG. (-WEST) (+EAST)	-90.	-80.	-70.	-60.	-50.	-40.	-30.
10.	.857E+01	.859E+01	.861E+01	.864E+01	.866E+01	.868E+01	.870E+01
20.	.857E+01	.859E+01	.862E+01	.864E+01	.866E+01	.868E+01	.870E+01
30.	.857E+01	.859E+01	.862E+01	.864E+01	.866E+01	.869E+01	.870E+01
40.	.857E+01	.859E+01	.862E+01	.864E+01	.866E+01	.868E+01	.870E+01
50.	.857E+01	.859E+01	.861E+01	.864E+01	.866E+01	.868E+01	.870E+01
60.	.857E+01	.859E+01	.861E+01	.863E+01	.865E+01	.867E+01	.869E+01
70.	.857E+01	.859E+01	.860E+01	.862E+01	.864E+01	.866E+01	.868E+01
80.	.857E+01	.858E+01	.860E+01	.861E+01	.863E+01	.865E+01	.866E+01
90.	.857E+01	.858E+01	.859E+01	.860E+01	.862E+01	.863E+01	.865E+01
100.	.857E+01	.858E+01	.858E+01	.859E+01	.860E+01	.862E+01	.863E+01
110.	.857E+01	.857E+01	.858E+01	.858E+01	.859E+01	.860E+01	.861E+01
120.	.857E+01	.857E+01	.857E+01	.857E+01	.858E+01	.858E+01	.859E+01
130.	.857E+01	.856E+01	.856E+01	.856E+01	.856E+01	.857E+01	.857E+01
140.	.857E+01	.856E+01	.855E+01	.855E+01	.855E+01	.855E+01	.856E+01
150.	.857E+01	.856E+01	.855E+01	.854E+01	.854E+01	.854E+01	.854E+01
160.	.857E+01	.855E+01	.854E+01	.853E+01	.853E+01	.853E+01	.853E+01
170.	.857E+01	.855E+01	.854E+01	.853E+01	.852E+01	.852E+01	.852E+01
180.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.851E+01	.851E+01
190.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
200.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
210.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
220.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
230.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
240.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
250.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.850E+01	.850E+01
260.	.857E+01	.855E+01	.853E+01	.852E+01	.851E+01	.851E+01	.851E+01
270.	.857E+01	.855E+01	.854E+01	.853E+01	.852E+01	.852E+01	.852E+01
280.	.857E+01	.855E+01	.854E+01	.853E+01	.853E+01	.853E+01	.853E+01
290.	.857E+01	.856E+01	.855E+01	.854E+01	.854E+01	.854E+01	.855E+01
300.	.857E+01	.856E+01	.856E+01	.856E+01	.856E+01	.856E+01	.857E+01
310.	.857E+01	.857E+01	.857E+01	.857E+01	.857E+01	.858E+01	.859E+01
320.	.857E+01	.857E+01	.858E+01	.858E+01	.859E+01	.860E+01	.861E+01
330.	.857E+01	.858E+01	.859E+01	.860E+01	.861E+01	.862E+01	.864E+01
340.	.857E+01	.858E+01	.859E+01	.861E+01	.862E+01	.864E+01	.866E+01
350.	.857E+01	.859E+01	.860E+01	.862E+01	.864E+01	.866E+01	.867E+01
360.	.857E+01	.859E+01	.861E+01	.863E+01	.865E+01	.867E+01	.869E+01

(02)

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YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XHJD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 105.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.071E+01	.072E+01	.073E+01	.074E+01	.074E+01	.074E+01	.074E+01
20.	.072E+01	.072E+01	.074E+01	.075E+01	.075E+01	.075E+01	.075E+01
30.	.072E+01	.073E+01	.074E+01	.075E+01	.075E+01	.075E+01	.075E+01
40.	.072E+01	.073E+01	.074E+01	.075E+01	.075E+01	.075E+01	.075E+01
50.	.071E+01	.073E+01	.073E+01	.074E+01	.074E+01	.074E+01	.074E+01
60.	.070E+01	.072E+01	.073E+01	.073E+01	.074E+01	.074E+01	.073E+01
70.	.069E+01	.070E+01	.071E+01	.072E+01	.072E+01	.072E+01	.072E+01
80.	.066E+01	.069E+01	.070E+01	.070E+01	.071E+01	.071E+01	.071E+01
90.	.066E+01	.067E+01	.068E+01	.069E+01	.069E+01	.069E+01	.070E+01
100.	.064E+01	.065E+01	.066E+01	.067E+01	.067E+01	.068E+01	.068E+01
110.	.062E+01	.063E+01	.064E+01	.065E+01	.065E+01	.066E+01	.066E+01
120.	.060E+01	.061E+01	.062E+01	.062E+01	.063E+01	.064E+01	.065E+01
130.	.058E+01	.059E+01	.060E+01	.060E+01	.061E+01	.062E+01	.063E+01
140.	.056E+01	.057E+01	.058E+01	.058E+01	.059E+01	.060E+01	.062E+01
150.	.055E+01	.055E+01	.056E+01	.056E+01	.056E+01	.059E+01	.060E+01
160.	.053E+01	.053E+01	.054E+01	.055E+01	.056E+01	.057E+01	.059E+01
170.	.052E+01	.052E+01	.053E+01	.054E+01	.055E+01	.056E+01	.058E+01
180.	.051E+01	.051E+01	.052E+01	.053E+01	.054E+01	.055E+01	.057E+01
190.	.050E+01	.050E+01	.051E+01	.052E+01	.053E+01	.055E+01	.057E+01
200.	.050E+01	.050E+01	.051E+01	.051E+01	.053E+01	.054E+01	.056E+01
210.	.050E+01	.050E+01	.050E+01	.051E+01	.053E+01	.054E+01	.056E+01
220.	.050E+01	.050E+01	.050E+01	.051E+01	.053E+01	.054E+01	.056E+01
230.	.050E+01	.050E+01	.050E+01	.051E+01	.053E+01	.054E+01	.056E+01
240.	.050E+01	.050E+01	.050E+01	.051E+01	.053E+01	.054E+01	.056E+01
250.	.050E+01	.050E+01	.051E+01	.052E+01	.053E+01	.055E+01	.057E+01
260.	.051E+01	.051E+01	.051E+01	.052E+01	.054E+01	.055E+01	.057E+01
270.	.052E+01	.052E+01	.053E+01	.054E+01	.055E+01	.056E+01	.058E+01
280.	.053E+01	.054E+01	.054E+01	.055E+01	.056E+01	.056E+01	.059E+01
290.	.055E+01	.056E+01	.056E+01	.057E+01	.058E+01	.059E+01	.061E+01
300.	.057E+01	.058E+01	.059E+01	.060E+01	.061E+01	.062E+01	.063E+01
310.	.060E+01	.061E+01	.061E+01	.062E+01	.063E+01	.064E+01	.065E+01
320.	.062E+01	.063E+01	.064E+01	.065E+01	.065E+01	.066E+01	.067E+01
330.	.065E+01	.066E+01	.066E+01	.067E+01	.068E+01	.068E+01	.069E+01
340.	.067E+01	.068E+01	.069E+01	.070E+01	.070E+01	.070E+01	.070E+01
350.	.069E+01	.070E+01	.071E+01	.071E+01	.072E+01	.072E+01	.072E+01
360.	.070E+01	.071E+01	.072E+01	.073E+01	.073E+01	.073E+01	.073E+01

(02)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440020. F10 = 100.00 F100 = 100.00 G1 = 0.00
 ALTITUDE = 105.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)				
	50.	60.	70.	80.	90.
10.	.073E+01	.072E+01	.071E+01	.070E+01	.068E+01
20.	.074E+01	.073E+01	.071E+01	.070E+01	.069E+01
30.	.074E+01	.073E+01	.072E+01	.070E+01	.068E+01
40.	.074E+01	.073E+01	.071E+01	.070E+01	.068E+01
50.	.073E+01	.072E+01	.071E+01	.070E+01	.068E+01
60.	.073E+01	.072E+01	.071E+01	.070E+01	.068E+01
70.	.072E+01	.071E+01	.070E+01	.069E+01	.068E+01
80.	.071E+01	.070E+01	.070E+01	.069E+01	.068E+01
90.	.070E+01	.069E+01	.069E+01	.069E+01	.068E+01
100.	.068E+01	.068E+01	.068E+01	.068E+01	.068E+01
110.	.067E+01	.067E+01	.068E+01	.068E+01	.068E+01
120.	.066E+01	.066E+01	.067E+01	.067E+01	.068E+01
130.	.064E+01	.065E+01	.066E+01	.067E+01	.068E+01
140.	.063E+01	.064E+01	.066E+01	.067E+01	.068E+01
150.	.062E+01	.063E+01	.065E+01	.067E+01	.068E+01
160.	.061E+01	.063E+01	.064E+01	.066E+01	.068E+01
170.	.060E+01	.062E+01	.064E+01	.066E+01	.068E+01
180.	.059E+01	.062E+01	.064E+01	.066E+01	.068E+01
190.	.059E+01	.061E+01	.064E+01	.066E+01	.068E+01
200.	.059E+01	.061E+01	.063E+01	.066E+01	.068E+01
210.	.059E+01	.061E+01	.063E+01	.066E+01	.068E+01
220.	.059E+01	.061E+01	.063E+01	.066E+01	.068E+01
230.	.059E+01	.061E+01	.063E+01	.066E+01	.068E+01
240.	.059E+01	.061E+01	.063E+01	.066E+01	.068E+01
250.	.059E+01	.061E+01	.064E+01	.066E+01	.068E+01
260.	.059E+01	.062E+01	.064E+01	.066E+01	.068E+01
270.	.060E+01	.062E+01	.064E+01	.066E+01	.068E+01
280.	.061E+01	.063E+01	.065E+01	.066E+01	.068E+01
290.	.062E+01	.064E+01	.065E+01	.067E+01	.068E+01
300.	.064E+01	.065E+01	.066E+01	.067E+01	.068E+01
310.	.065E+01	.066E+01	.067E+01	.067E+01	.068E+01
320.	.067E+01	.067E+01	.068E+01	.068E+01	.068E+01
330.	.069E+01	.069E+01	.069E+01	.068E+01	.068E+01
340.	.070E+01	.070E+01	.069E+01	.069E+01	.068E+01
350.	.072E+01	.071E+01	.070E+01	.069E+01	.068E+01
360.	.073E+01	.072E+01	.071E+01	.069E+01	.068E+01

(0)

YR = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 LATITUDE = 165.0

	(-SOUTH) LATITUDES (-NORTH)						
CON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(-EAST)							
10.	.971E+01	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01	.975E+01
20.	.971E+01	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01	.975E+01
30.	.971E+01	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01	.975E+01
40.	.971E+01	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01	.975E+01
50.	.971E+01	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01	.975E+01
60.	.971E+01	.972E+01	.973E+01	.973E+01	.974E+01	.974E+01	.975E+01
70.	.971E+01	.972E+01	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01
80.	.971E+01	.972E+01	.972E+01	.973E+01	.973E+01	.974E+01	.974E+01
90.	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01	.973E+01	.974E+01
00.	.971E+01	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01	.973E+01
10.	.971E+01	.971E+01	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01
20.	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.972E+01	.972E+01
30.	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01
40.	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01
50.	.971E+01	.971E+01	.970E+01	.970E+01	.970E+01	.970E+01	.970E+01
60.	.971E+01	.971E+01	.970E+01	.970E+01	.970E+01	.970E+01	.970E+01
70.	.971E+01	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01
80.	.971E+01	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01
90.	.971E+01	.971E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
00.	.971E+01	.971E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
10.	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
20.	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
30.	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
40.	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
50.	.971E+01	.971E+01	.970E+01	.969E+01	.969E+01	.969E+01	.969E+01
60.	.971E+01	.971E+01	.970E+01	.970E+01	.969E+01	.969E+01	.969E+01
70.	.971E+01	.971E+01	.970E+01	.970E+01	.970E+01	.970E+01	.970E+01
80.	.971E+01	.971E+01	.970E+01	.970E+01	.970E+01	.970E+01	.970E+01
90.	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01
00.	.971E+01	.971E+01	.971E+01	.971E+01	.971E+01	.972E+01	.972E+01
10.	.971E+01	.971E+01	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01
20.	.971E+01	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01	.973E+01
30.	.971E+01	.972E+01	.972E+01	.972E+01	.973E+01	.974E+01	.974E+01
40.	.971E+01	.972E+01	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
50.	.971E+01	.972E+01	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01
60.	.971E+01	.972E+01	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01

[illegible]

(0)

PAGE 3

R = 1969 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
AJD = 2440026. F10 = 100.00 F10B = 100.00 GI = 0.00
LATITUDE = 105.0

	(-SOUTH) LATITUDES (+NORTH)				
CON.	50.	60.	70.	80.	90.
-WEST)					
+EAST)					
10.	.976E+01	.976E+01	.976E+01	.975E+01	.975E+01
20.	.976E+01	.976E+01	.976E+01	.975E+01	.975E+01
30.	.977E+01	.976E+01	.976E+01	.975E+01	.975E+01
40.	.976E+01	.976E+01	.976E+01	.975E+01	.975E+01
50.	.976E+01	.976E+01	.976E+01	.975E+01	.975E+01
60.	.975E+01	.976E+01	.976E+01	.975E+01	.975E+01
70.	.976E+01	.976E+01	.975E+01	.975E+01	.975E+01
80.	.976E+01	.975E+01	.975E+01	.975E+01	.975E+01
90.	.975E+01	.975E+01	.975E+01	.975E+01	.975E+01
100.	.975E+01	.975E+01	.975E+01	.975E+01	.975E+01
110.	.974E+01	.975E+01	.975E+01	.975E+01	.975E+01
120.	.974E+01	.974E+01	.974E+01	.975E+01	.975E+01
130.	.974E+01	.974E+01	.974E+01	.974E+01	.975E+01
140.	.973E+01	.974E+01	.974E+01	.974E+01	.975E+01
150.	.973E+01	.973E+01	.974E+01	.974E+01	.975E+01
160.	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01
170.	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01
180.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
190.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
200.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
210.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
220.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
230.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
240.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
250.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
260.	.972E+01	.973E+01	.973E+01	.974E+01	.975E+01
270.	.972E+01	.973E+01	.974E+01	.974E+01	.975E+01
280.	.973E+01	.973E+01	.974E+01	.974E+01	.975E+01
290.	.973E+01	.973E+01	.974E+01	.974E+01	.975E+01
300.	.973E+01	.974E+01	.974E+01	.974E+01	.975E+01
310.	.974E+01	.974E+01	.974E+01	.975E+01	.975E+01
320.	.974E+01	.975E+01	.975E+01	.975E+01	.975E+01
330.	.975E+01	.975E+01	.975E+01	.975E+01	.975E+01
340.	.975E+01	.975E+01	.975E+01	.975E+01	.975E+01
350.	.976E+01	.976E+01	.975E+01	.975E+01	.975E+01
360.	.976E+01	.976E+01	.976E+01	.975E+01	.975E+01

(A)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 AMJD = 2440020. F10 = 100.00 F108 = 100.00 G1 = 0.00
 ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.662E+01	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01	.679E+01
20.	.662E+01	.665E+01	.668E+01	.672E+01	.675E+01	.677E+01	.680E+01
30.	.662E+01	.665E+01	.669E+01	.672E+01	.675E+01	.679E+01	.680E+01
40.	.662E+01	.665E+01	.668E+01	.672E+01	.675E+01	.677E+01	.680E+01
50.	.662E+01	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01	.679E+01
60.	.662E+01	.665E+01	.668E+01	.670E+01	.673E+01	.676E+01	.678E+01
70.	.662E+01	.664E+01	.667E+01	.669E+01	.672E+01	.674E+01	.677E+01
80.	.662E+01	.664E+01	.666E+01	.667E+01	.670E+01	.673E+01	.675E+01
90.	.662E+01	.663E+01	.665E+01	.667E+01	.669E+01	.671E+01	.673E+01
100.	.662E+01	.663E+01	.664E+01	.665E+01	.667E+01	.669E+01	.670E+01
110.	.662E+01	.662E+01	.663E+01	.664E+01	.665E+01	.666E+01	.668E+01
120.	.662E+01	.662E+01	.662E+01	.662E+01	.663E+01	.664E+01	.665E+01
130.	.662E+01	.661E+01	.661E+01	.661E+01	.661E+01	.662E+01	.663E+01
140.	.662E+01	.661E+01	.660E+01	.659E+01	.659E+01	.660E+01	.660E+01
150.	.662E+01	.660E+01	.659E+01	.658E+01	.658E+01	.658E+01	.658E+01
160.	.662E+01	.660E+01	.658E+01	.657E+01	.657E+01	.656E+01	.657E+01
170.	.662E+01	.660E+01	.658E+01	.656E+01	.655E+01	.655E+01	.655E+01
180.	.662E+01	.660E+01	.657E+01	.656E+01	.655E+01	.654E+01	.654E+01
190.	.662E+01	.660E+01	.657E+01	.655E+01	.654E+01	.653E+01	.653E+01
200.	.662E+01	.659E+01	.657E+01	.655E+01	.654E+01	.653E+01	.653E+01
210.	.662E+01	.659E+01	.657E+01	.655E+01	.654E+01	.653E+01	.653E+01
220.	.662E+01	.659E+01	.657E+01	.655E+01	.654E+01	.653E+01	.652E+01
230.	.662E+01	.659E+01	.657E+01	.655E+01	.654E+01	.653E+01	.652E+01
240.	.662E+01	.659E+01	.657E+01	.655E+01	.654E+01	.653E+01	.653E+01
250.	.662E+01	.660E+01	.657E+01	.655E+01	.654E+01	.653E+01	.653E+01
260.	.662E+01	.660E+01	.657E+01	.656E+01	.655E+01	.654E+01	.654E+01
270.	.662E+01	.660E+01	.658E+01	.656E+01	.656E+01	.655E+01	.655E+01
280.	.662E+01	.660E+01	.659E+01	.657E+01	.657E+01	.657E+01	.657E+01
290.	.662E+01	.661E+01	.659E+01	.659E+01	.659E+01	.659E+01	.659E+01
300.	.662E+01	.661E+01	.661E+01	.660E+01	.661E+01	.661E+01	.662E+01
310.	.662E+01	.662E+01	.662E+01	.662E+01	.663E+01	.664E+01	.665E+01
320.	.662E+01	.662E+01	.663E+01	.664E+01	.665E+01	.667E+01	.668E+01
330.	.662E+01	.663E+01	.664E+01	.666E+01	.667E+01	.669E+01	.671E+01
340.	.662E+01	.664E+01	.665E+01	.667E+01	.670E+01	.672E+01	.674E+01
350.	.662E+01	.664E+01	.667E+01	.669E+01	.671E+01	.674E+01	.676E+01
360.	.662E+01	.665E+01	.667E+01	.670E+01	.673E+01	.675E+01	.678E+01

(A)

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440020. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 195.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.681E+01	.683E+01	.684E+01	.685E+01	.685E+01	.685E+01	.685E+01
20.	.682E+01	.684E+01	.685E+01	.686E+01	.686E+01	.686E+01	.686E+01
30.	.682E+01	.684E+01	.685E+01	.686E+01	.687E+01	.687E+01	.686E+01
40.	.682E+01	.684E+01	.685E+01	.686E+01	.686E+01	.686E+01	.686E+01
50.	.681E+01	.683E+01	.684E+01	.685E+01	.686E+01	.686E+01	.685E+01
60.	.680E+01	.682E+01	.683E+01	.684E+01	.684E+01	.684E+01	.684E+01
70.	.679E+01	.680E+01	.681E+01	.682E+01	.683E+01	.683E+01	.683E+01
80.	.677E+01	.678E+01	.679E+01	.680E+01	.681E+01	.681E+01	.681E+01
90.	.674E+01	.676E+01	.677E+01	.678E+01	.678E+01	.679E+01	.679E+01
100.	.672E+01	.673E+01	.674E+01	.675E+01	.676E+01	.677E+01	.677E+01
110.	.669E+01	.670E+01	.671E+01	.672E+01	.673E+01	.674E+01	.675E+01
120.	.666E+01	.667E+01	.669E+01	.670E+01	.671E+01	.672E+01	.673E+01
130.	.664E+01	.665E+01	.666E+01	.667E+01	.668E+01	.669E+01	.670E+01
140.	.661E+01	.662E+01	.663E+01	.664E+01	.665E+01	.667E+01	.668E+01
150.	.659E+01	.660E+01	.660E+01	.662E+01	.663E+01	.665E+01	.667E+01
160.	.657E+01	.657E+01	.658E+01	.659E+01	.661E+01	.663E+01	.665E+01
170.	.655E+01	.656E+01	.656E+01	.658E+01	.659E+01	.661E+01	.664E+01
180.	.654E+01	.654E+01	.655E+01	.656E+01	.658E+01	.660E+01	.663E+01
190.	.653E+01	.653E+01	.654E+01	.655E+01	.657E+01	.659E+01	.662E+01
200.	.653E+01	.653E+01	.654E+01	.655E+01	.657E+01	.659E+01	.662E+01
210.	.652E+01	.653E+01	.653E+01	.655E+01	.656E+01	.659E+01	.661E+01
220.	.652E+01	.653E+01	.653E+01	.655E+01	.656E+01	.659E+01	.661E+01
230.	.652E+01	.653E+01	.653E+01	.655E+01	.656E+01	.659E+01	.661E+01
240.	.653E+01	.653E+01	.653E+01	.655E+01	.656E+01	.659E+01	.661E+01
250.	.653E+01	.653E+01	.654E+01	.655E+01	.657E+01	.659E+01	.662E+01
260.	.654E+01	.654E+01	.655E+01	.656E+01	.658E+01	.660E+01	.662E+01
270.	.655E+01	.656E+01	.656E+01	.658E+01	.659E+01	.661E+01	.664E+01
280.	.657E+01	.658E+01	.659E+01	.660E+01	.661E+01	.663E+01	.665E+01
290.	.660E+01	.661E+01	.661E+01	.663E+01	.664E+01	.665E+01	.667E+01
300.	.663E+01	.664E+01	.665E+01	.666E+01	.667E+01	.668E+01	.670E+01
310.	.666E+01	.667E+01	.668E+01	.669E+01	.670E+01	.671E+01	.672E+01
320.	.669E+01	.671E+01	.672E+01	.673E+01	.674E+01	.674E+01	.675E+01
330.	.672E+01	.674E+01	.675E+01	.676E+01	.677E+01	.677E+01	.678E+01
340.	.675E+01	.677E+01	.678E+01	.679E+01	.680E+01	.680E+01	.680E+01
350.	.678E+01	.679E+01	.681E+01	.682E+01	.682E+01	.682E+01	.682E+01
360.	.680E+01	.681E+01	.683E+01	.684E+01	.684E+01	.684E+01	.684E+01

(A)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440029. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)				
ON.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	.684E+01	.683E+01	.681E+01	.679E+01	.677E+01
20.	.685E+01	.683E+01	.682E+01	.679E+01	.677E+01
30.	.685E+01	.684E+01	.682E+01	.679E+01	.677E+01
40.	.685E+01	.683E+01	.682E+01	.679E+01	.677E+01
50.	.684E+01	.683E+01	.681E+01	.679E+01	.677E+01
60.	.683E+01	.682E+01	.681E+01	.679E+01	.677E+01
70.	.682E+01	.681E+01	.680E+01	.679E+01	.677E+01
80.	.681E+01	.680E+01	.679E+01	.678E+01	.677E+01
90.	.679E+01	.679E+01	.678E+01	.678E+01	.677E+01
100.	.677E+01	.677E+01	.677E+01	.677E+01	.677E+01
110.	.676E+01	.676E+01	.676E+01	.677E+01	.677E+01
120.	.674E+01	.675E+01	.675E+01	.676E+01	.677E+01
130.	.672E+01	.673E+01	.675E+01	.676E+01	.677E+01
140.	.670E+01	.672E+01	.674E+01	.675E+01	.677E+01
150.	.669E+01	.671E+01	.673E+01	.675E+01	.677E+01
160.	.667E+01	.670E+01	.672E+01	.675E+01	.677E+01
170.	.666E+01	.669E+01	.672E+01	.674E+01	.677E+01
180.	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01
190.	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01
200.	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01
210.	.664E+01	.668E+01	.671E+01	.674E+01	.677E+01
220.	.664E+01	.668E+01	.671E+01	.674E+01	.677E+01
230.	.664E+01	.668E+01	.671E+01	.674E+01	.677E+01
240.	.664E+01	.668E+01	.671E+01	.674E+01	.677E+01
250.	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01
260.	.665E+01	.668E+01	.671E+01	.674E+01	.677E+01
270.	.666E+01	.669E+01	.672E+01	.674E+01	.677E+01
280.	.668E+01	.670E+01	.672E+01	.675E+01	.677E+01
290.	.669E+01	.671E+01	.673E+01	.675E+01	.677E+01
300.	.671E+01	.673E+01	.674E+01	.676E+01	.677E+01
310.	.673E+01	.674E+01	.675E+01	.676E+01	.677E+01
320.	.676E+01	.676E+01	.677E+01	.677E+01	.677E+01
330.	.678E+01	.678E+01	.678E+01	.677E+01	.677E+01
340.	.680E+01	.679E+01	.679E+01	.678E+01	.677E+01
350.	.682E+01	.681E+01	.680E+01	.678E+01	.677E+01
360.	.683E+01	.682E+01	.681E+01	.679E+01	.677E+01

(HE)

Y = 1969 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 105.0

	(-SOUTH) LATITUDES (+NORTH)						
CON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
20.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
30.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
40.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
50.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
60.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
70.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
80.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
90.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01
100.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
110.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
120.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
130.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
140.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
150.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
160.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
170.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
180.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
190.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
200.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
210.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
220.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
230.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
240.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
250.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
260.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
270.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
280.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
290.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
300.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
310.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
320.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
330.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01
340.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01
350.	.712E+01	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
360.	.712E+01	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01

[illegible]

(HE)

PAGE 3

R = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
IJD = 2440028. F10 = 100.00 F10B = 100.00 CI = 0.00
ALTITUDE = 165.0

(-SOUTH) LATITUDES (+NORTH)
CON. 50. 60. 70. 80. 90.
(-WEST)
(+EAST)

10.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
20.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
30.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
40.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
50.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
60.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
70.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
80.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
90.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
100.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
110.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
120.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
130.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
140.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
150.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
160.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
170.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
180.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
190.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
200.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
210.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
220.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
230.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
240.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
250.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
260.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
270.	.712E+01	.712E+01	.712E+01	.711E+01	.711E+01
280.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
290.	.712E+01	.712E+01	.711E+01	.711E+01	.711E+01
300.	.712E+01	.711E+01	.711E+01	.711E+01	.711E+01
310.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
320.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
330.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
340.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
350.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01
360.	.711E+01	.711E+01	.711E+01	.711E+01	.711E+01

MEAN MOL WT

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 AMJD = 2440028, F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 165.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-90.	-80.	-70.	-60.	-50.	-40.	-30.
10.	.216E+02	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02	.221E+02
20.	.216E+02	.217E+02	.218E+02	.219E+02	.220E+02	.221E+02	.221E+02
30.	.216E+02	.217E+02	.218E+02	.219E+02	.220E+02	.221E+02	.221E+02
40.	.216E+02	.217E+02	.218E+02	.219E+02	.220E+02	.221E+02	.221E+02
50.	.216E+02	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02	.221E+02
60.	.216E+02	.217E+02	.218E+02	.218E+02	.219E+02	.220E+02	.221E+02
70.	.216E+02	.217E+02	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
80.	.216E+02	.217E+02	.217E+02	.218E+02	.218E+02	.219E+02	.220E+02
90.	.216E+02	.217E+02	.217E+02	.217E+02	.218E+02	.219E+02	.219E+02
100.	.216E+02	.216E+02	.217E+02	.217E+02	.217E+02	.218E+02	.218E+02
110.	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02	.217E+02	.218E+02
120.	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02
130.	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02
140.	.216E+02	.216E+02	.216E+02	.215E+02	.215E+02	.216E+02	.216E+02
150.	.216E+02	.216E+02	.215E+02	.215E+02	.215E+02	.215E+02	.215E+02
160.	.216E+02	.216E+02	.215E+02	.215E+02	.215E+02	.215E+02	.215E+02
170.	.216E+02	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02
180.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
190.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
200.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
210.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.213E+02
220.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.213E+02
230.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.213E+02
240.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
250.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
260.	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02	.214E+02
270.	.216E+02	.216E+02	.215E+02	.215E+02	.214E+02	.214E+02	.214E+02
280.	.216E+02	.216E+02	.215E+02	.215E+02	.215E+02	.215E+02	.215E+02
290.	.216E+02	.216E+02	.215E+02	.215E+02	.215E+02	.215E+02	.215E+02
300.	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02
310.	.216E+02	.216E+02	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02
320.	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02	.217E+02	.218E+02
330.	.216E+02	.216E+02	.217E+02	.217E+02	.218E+02	.218E+02	.219E+02
340.	.216E+02	.217E+02	.217E+02	.218E+02	.218E+02	.219E+02	.219E+02
350.	.216E+02	.217E+02	.217E+02	.218E+02	.219E+02	.219E+02	.220E+02
360.	.216E+02	.217E+02	.218E+02	.218E+02	.219E+02	.220E+02	.221E+02

MEAN MOL UT

PAGE 2

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 (MJD = 2440028. F10 = 100.00 F108 = 100.00 G1 = 0.00
 ALTITUDE = 185.0

CON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.222E+02	.222E+02	.223E+02	.223E+02	.223E+02	.223E+02	.223E+02
20.	.222E+02	.222E+02	.223E+02	.223E+02	.223E+02	.223E+02	.223E+02
30.	.222E+02	.222E+02	.223E+02	.223E+02	.223E+02	.223E+02	.223E+02
40.	.222E+02	.222E+02	.223E+02	.223E+02	.223E+02	.223E+02	.223E+02
50.	.222E+02	.222E+02	.223E+02	.223E+02	.223E+02	.223E+02	.223E+02
60.	.221E+02	.222E+02	.222E+02	.222E+02	.223E+02	.223E+02	.222E+02
70.	.221E+02	.221E+02	.222E+02	.222E+02	.222E+02	.222E+02	.222E+02
80.	.220E+02	.221E+02	.221E+02	.221E+02	.222E+02	.222E+02	.222E+02
90.	.220E+02	.220E+02	.220E+02	.221E+02	.221E+02	.221E+02	.221E+02
100.	.219E+02	.219E+02	.220E+02	.220E+02	.220E+02	.220E+02	.220E+02
110.	.218E+02	.218E+02	.219E+02	.219E+02	.219E+02	.220E+02	.220E+02
120.	.217E+02	.218E+02	.218E+02	.218E+02	.219E+02	.219E+02	.219E+02
130.	.217E+02	.217E+02	.217E+02	.217E+02	.218E+02	.218E+02	.219E+02
140.	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02	.217E+02	.218E+02
150.	.215E+02	.215E+02	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02
160.	.215E+02	.215E+02	.215E+02	.215E+02	.216E+02	.216E+02	.217E+02
170.	.214E+02	.214E+02	.215E+02	.215E+02	.215E+02	.216E+02	.217E+02
180.	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02	.216E+02
190.	.214E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
200.	.214E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
210.	.213E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
220.	.213E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
230.	.213E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
240.	.213E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
250.	.214E+02	.214E+02	.214E+02	.214E+02	.215E+02	.215E+02	.216E+02
260.	.214E+02	.214E+02	.214E+02	.214E+02	.215E+02	.216E+02	.216E+02
270.	.214E+02	.214E+02	.215E+02	.215E+02	.215E+02	.216E+02	.217E+02
280.	.215E+02	.215E+02	.215E+02	.215E+02	.216E+02	.216E+02	.217E+02
290.	.215E+02	.216E+02	.216E+02	.216E+02	.217E+02	.217E+02	.218E+02
300.	.216E+02	.217E+02	.217E+02	.217E+02	.217E+02	.218E+02	.218E+02
310.	.217E+02	.218E+02	.218E+02	.218E+02	.218E+02	.219E+02	.219E+02
320.	.218E+02	.219E+02	.219E+02	.219E+02	.219E+02	.220E+02	.220E+02
330.	.219E+02	.219E+02	.220E+02	.220E+02	.220E+02	.220E+02	.221E+02
340.	.220E+02	.220E+02	.221E+02	.221E+02	.221E+02	.221E+02	.221E+02
350.	.221E+02	.221E+02	.221E+02	.222E+02	.222E+02	.222E+02	.222E+02
360.	.221E+02	.222E+02	.222E+02	.222E+02	.222E+02	.222E+02	.222E+02

MEAN MOL UT

PAGE :

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 185.0

(-SOUTH) LATITUDES (+NORTH)					
0N.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	.223E+02	.222E+02	.222E+02	.221E+02	.220E+02
20.	.223E+02	.222E+02	.222E+02	.221E+02	.220E+02
30.	.223E+02	.222E+02	.222E+02	.221E+02	.220E+02
40.	.223E+02	.222E+02	.222E+02	.221E+02	.220E+02
50.	.223E+02	.222E+02	.222E+02	.221E+02	.220E+02
60.	.222E+02	.222E+02	.222E+02	.221E+02	.220E+02
70.	.222E+02	.222E+02	.221E+02	.221E+02	.220E+02
80.	.221E+02	.221E+02	.221E+02	.221E+02	.220E+02
90.	.221E+02	.221E+02	.221E+02	.221E+02	.220E+02
100.	.220E+02	.221E+02	.221E+02	.220E+02	.220E+02
110.	.220E+02	.220E+02	.220E+02	.220E+02	.220E+02
120.	.219E+02	.220E+02	.220E+02	.220E+02	.220E+02
130.	.219E+02	.219E+02	.220E+02	.220E+02	.220E+02
140.	.218E+02	.219E+02	.219E+02	.220E+02	.220E+02
150.	.218E+02	.219E+02	.219E+02	.220E+02	.220E+02
160.	.218E+02	.218E+02	.219E+02	.220E+02	.220E+02
170.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
180.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
190.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
200.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
210.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
220.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
230.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
240.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
250.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
260.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
270.	.217E+02	.218E+02	.219E+02	.220E+02	.220E+02
280.	.218E+02	.218E+02	.219E+02	.220E+02	.220E+02
290.	.218E+02	.219E+02	.219E+02	.220E+02	.220E+02
300.	.219E+02	.219E+02	.220E+02	.220E+02	.220E+02
310.	.219E+02	.220E+02	.220E+02	.220E+02	.220E+02
320.	.220E+02	.220E+02	.220E+02	.220E+02	.220E+02
330.	.221E+02	.221E+02	.221E+02	.221E+02	.220E+02
340.	.221E+02	.221E+02	.221E+02	.221E+02	.220E+02
350.	.222E+02	.222E+02	.221E+02	.221E+02	.220E+02
360.	.222E+02	.222E+02	.221E+02	.221E+02	.220E+02

LOG DEN (GM/CM3)

PAGE 1

R = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
MJD = 2440020. F10 = 100.00 F10B = 100.00 GI = 0.00
LATITUDE = 105.0

	(-SOUTH) LATITUDES (+NORTH)						
ON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
20.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
30.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
40.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
50.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
60.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
70.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
80.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
90.	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
100.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02
110.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02
120.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
130.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
140.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
150.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
160.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
170.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
180.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
190.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
200.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
210.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
220.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
230.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
240.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
250.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
260.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
270.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
280.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
290.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
300.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
310.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
320.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02
330.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02
340.	-.125E+02	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
350.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02
360.	-.125E+02	-.125E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.124E+02

PAGE

[illegible]

(-SOUTH) LATITUDES (+NORTH)

-ON.	50.	60.	70.	80.	90.
-WEST)					
(+EAST)					

[illegible]

[illegible]

TEMP. DEG. K

PAGE 1

YR = 1966 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440028. F10 = 100.00 F108 = 100.00 G1 = 0.00
 ALTITUDE = 185.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-90.	-80.	-70.	-60.	-50.	-40.	-30.
10.	.659E+03	.670E+03	.681E+03	.693E+03	.705E+03	.716E+03	.727E+03
20.	.659E+03	.670E+03	.683E+03	.695E+03	.708E+03	.720E+03	.731E+03
30.	.659E+03	.671E+03	.683E+03	.696E+03	.709E+03	.721E+03	.732E+03
40.	.659E+03	.670E+03	.683E+03	.696E+03	.708E+03	.720E+03	.731E+03
50.	.659E+03	.670E+03	.681E+03	.693E+03	.705E+03	.717E+03	.727E+03
60.	.659E+03	.668E+03	.679E+03	.690E+03	.701E+03	.712E+03	.722E+03
70.	.659E+03	.667E+03	.676E+03	.686E+03	.695E+03	.705E+03	.714E+03
80.	.659E+03	.665E+03	.672E+03	.680E+03	.689E+03	.697E+03	.705E+03
90.	.659E+03	.663E+03	.669E+03	.675E+03	.682E+03	.689E+03	.696E+03
100.	.659E+03	.661E+03	.664E+03	.669E+03	.674E+03	.680E+03	.685E+03
110.	.659E+03	.659E+03	.660E+03	.663E+03	.666E+03	.670E+03	.675E+03
120.	.659E+03	.657E+03	.656E+03	.657E+03	.659E+03	.661E+03	.665E+03
130.	.659E+03	.655E+03	.652E+03	.651E+03	.652E+03	.653E+03	.655E+03
140.	.659E+03	.653E+03	.649E+03	.646E+03	.645E+03	.645E+03	.647E+03
150.	.659E+03	.652E+03	.646E+03	.642E+03	.639E+03	.638E+03	.639E+03
160.	.659E+03	.650E+03	.643E+03	.638E+03	.635E+03	.633E+03	.633E+03
170.	.659E+03	.649E+03	.641E+03	.635E+03	.631E+03	.628E+03	.627E+03
180.	.659E+03	.649E+03	.640E+03	.633E+03	.628E+03	.625E+03	.623E+03
190.	.659E+03	.648E+03	.639E+03	.632E+03	.626E+03	.623E+03	.621E+03
200.	.659E+03	.648E+03	.638E+03	.631E+03	.625E+03	.621E+03	.619E+03
210.	.659E+03	.648E+03	.638E+03	.630E+03	.624E+03	.621E+03	.619E+03
220.	.659E+03	.648E+03	.638E+03	.630E+03	.624E+03	.621E+03	.619E+03
230.	.659E+03	.648E+03	.638E+03	.630E+03	.624E+03	.621E+03	.619E+03
240.	.659E+03	.648E+03	.638E+03	.631E+03	.625E+03	.621E+03	.619E+03
250.	.659E+03	.648E+03	.639E+03	.631E+03	.626E+03	.622E+03	.620E+03
260.	.659E+03	.648E+03	.640E+03	.633E+03	.628E+03	.624E+03	.623E+03
270.	.659E+03	.649E+03	.641E+03	.635E+03	.631E+03	.628E+03	.627E+03
280.	.659E+03	.651E+03	.644E+03	.639E+03	.635E+03	.634E+03	.634E+03
290.	.659E+03	.652E+03	.647E+03	.644E+03	.642E+03	.641E+03	.642E+03
300.	.659E+03	.654E+03	.651E+03	.649E+03	.649E+03	.650E+03	.652E+03
310.	.659E+03	.657E+03	.656E+03	.656E+03	.658E+03	.660E+03	.664E+03
320.	.659E+03	.659E+03	.661E+03	.663E+03	.667E+03	.671E+03	.676E+03
330.	.659E+03	.662E+03	.666E+03	.671E+03	.676E+03	.682E+03	.688E+03
340.	.659E+03	.664E+03	.670E+03	.676E+03	.685E+03	.693E+03	.700E+03
350.	.659E+03	.666E+03	.675E+03	.684E+03	.693E+03	.702E+03	.711E+03
360.	.659E+03	.668E+03	.678E+03	.689E+03	.700E+03	.710E+03	.720E+03

TEMP. DEG. K

PAGE 2

R = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 LATITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)						
ON. -WEST) +EAST)	-20.	-10.	0.	10.	20.	30.	40.
10.	.736E+03	.744E+03	.750E+03	.754E+03	.756E+03	.756E+03	.754E+03
20.	.740E+03	.748E+03	.755E+03	.759E+03	.761E+03	.760E+03	.758E+03
30.	.742E+03	.750E+03	.756E+03	.760E+03	.762E+03	.762E+03	.759E+03
40.	.741E+03	.749E+03	.755E+03	.759E+03	.761E+03	.761E+03	.758E+03
50.	.737E+03	.745E+03	.751E+03	.755E+03	.757E+03	.757E+03	.755E+03
60.	.731E+03	.738E+03	.744E+03	.748E+03	.751E+03	.751E+03	.750E+03
70.	.722E+03	.730E+03	.735E+03	.740E+03	.742E+03	.743E+03	.743E+03
80.	.713E+03	.719E+03	.725E+03	.729E+03	.732E+03	.734E+03	.735E+03
90.	.702E+03	.708E+03	.714E+03	.718E+03	.722E+03	.724E+03	.726E+03
100.	.691E+03	.697E+03	.702E+03	.706E+03	.710E+03	.714E+03	.716E+03
110.	.680E+03	.685E+03	.689E+03	.694E+03	.699E+03	.703E+03	.707E+03
120.	.669E+03	.673E+03	.678E+03	.682E+03	.687E+03	.692E+03	.697E+03
130.	.659E+03	.662E+03	.666E+03	.671E+03	.677E+03	.683E+03	.689E+03
140.	.649E+03	.652E+03	.656E+03	.661E+03	.667E+03	.674E+03	.681E+03
150.	.641E+03	.643E+03	.647E+03	.652E+03	.658E+03	.666E+03	.674E+03
160.	.634E+03	.636E+03	.639E+03	.644E+03	.651E+03	.659E+03	.668E+03
170.	.628E+03	.630E+03	.633E+03	.638E+03	.645E+03	.654E+03	.663E+03
180.	.624E+03	.625E+03	.629E+03	.634E+03	.641E+03	.650E+03	.660E+03
190.	.621E+03	.622E+03	.626E+03	.631E+03	.638E+03	.647E+03	.657E+03
200.	.619E+03	.621E+03	.624E+03	.629E+03	.636E+03	.645E+03	.656E+03
210.	.619E+03	.620E+03	.623E+03	.628E+03	.636E+03	.645E+03	.655E+03
220.	.618E+03	.620E+03	.623E+03	.628E+03	.635E+03	.644E+03	.655E+03
230.	.618E+03	.620E+03	.623E+03	.628E+03	.635E+03	.645E+03	.655E+03
240.	.619E+03	.620E+03	.623E+03	.629E+03	.636E+03	.645E+03	.655E+03
250.	.620E+03	.622E+03	.625E+03	.630E+03	.637E+03	.646E+03	.657E+03
260.	.623E+03	.625E+03	.628E+03	.633E+03	.640E+03	.649E+03	.659E+03
270.	.628E+03	.630E+03	.633E+03	.638E+03	.645E+03	.654E+03	.663E+03
280.	.635E+03	.637E+03	.641E+03	.646E+03	.652E+03	.660E+03	.669E+03
290.	.644E+03	.647E+03	.651E+03	.656E+03	.662E+03	.669E+03	.676E+03
300.	.655E+03	.658E+03	.662E+03	.667E+03	.673E+03	.679E+03	.686E+03
310.	.667E+03	.672E+03	.676E+03	.681E+03	.686E+03	.691E+03	.696E+03
320.	.681E+03	.686E+03	.691E+03	.695E+03	.700E+03	.704E+03	.708E+03
330.	.695E+03	.700E+03	.705E+03	.710E+03	.714E+03	.717E+03	.719E+03
340.	.708E+03	.714E+03	.719E+03	.724E+03	.727E+03	.729E+03	.730E+03
350.	.719E+03	.726E+03	.732E+03	.736E+03	.739E+03	.740E+03	.740E+03
360.	.729E+03	.736E+03	.742E+03	.746E+03	.749E+03	.749E+03	.748E+03

TEMP. DEG. K

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
XNJD = 2440028. F10 = 100.00 F10B = 100.00 CI = 0.00
ALTITUDE = 185.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)				
	50.	60.	70.	80.	90.
10.	.750E+03	.744E+03	.737E+03	.728E+03	.717E+03
20.	.753E+03	.747E+03	.738E+03	.729E+03	.717E+03
30.	.754E+03	.748E+03	.739E+03	.729E+03	.717E+03
40.	.754E+03	.747E+03	.739E+03	.729E+03	.717E+03
50.	.751E+03	.745E+03	.737E+03	.728E+03	.717E+03
60.	.746E+03	.741E+03	.735E+03	.727E+03	.717E+03
70.	.740E+03	.737E+03	.732E+03	.725E+03	.717E+03
80.	.734E+03	.731E+03	.728E+03	.723E+03	.717E+03
90.	.726E+03	.725E+03	.724E+03	.721E+03	.717E+03
100.	.718E+03	.719E+03	.719E+03	.719E+03	.717E+03
110.	.710E+03	.713E+03	.715E+03	.717E+03	.717E+03
120.	.702E+03	.707E+03	.711E+03	.715E+03	.717E+03
130.	.695E+03	.701E+03	.707E+03	.713E+03	.717E+03
140.	.688E+03	.696E+03	.704E+03	.711E+03	.717E+03
150.	.682E+03	.691E+03	.700E+03	.709E+03	.717E+03
160.	.677E+03	.688E+03	.698E+03	.708E+03	.717E+03
170.	.673E+03	.685E+03	.696E+03	.707E+03	.717E+03
180.	.671E+03	.682E+03	.694E+03	.706E+03	.717E+03
190.	.669E+03	.681E+03	.693E+03	.706E+03	.717E+03
200.	.667E+03	.680E+03	.693E+03	.705E+03	.717E+03
210.	.667E+03	.679E+03	.692E+03	.705E+03	.717E+03
220.	.667E+03	.679E+03	.692E+03	.705E+03	.717E+03
230.	.667E+03	.679E+03	.692E+03	.705E+03	.717E+03
240.	.667E+03	.680E+03	.692E+03	.705E+03	.717E+03
250.	.668E+03	.680E+03	.693E+03	.705E+03	.717E+03
260.	.670E+03	.682E+03	.694E+03	.706E+03	.717E+03
270.	.674E+03	.685E+03	.696E+03	.707E+03	.717E+03
280.	.678E+03	.688E+03	.698E+03	.708E+03	.717E+03
290.	.685E+03	.693E+03	.702E+03	.710E+03	.717E+03
300.	.692E+03	.699E+03	.706E+03	.712E+03	.717E+03
310.	.701E+03	.706E+03	.710E+03	.714E+03	.717E+03
320.	.711E+03	.714E+03	.716E+03	.717E+03	.717E+03
330.	.721E+03	.721E+03	.721E+03	.720E+03	.717E+03
340.	.730E+03	.728E+03	.726E+03	.722E+03	.717E+03
350.	.738E+03	.735E+03	.730E+03	.724E+03	.717E+03
360.	.745E+03	.740E+03	.734E+03	.726E+03	.717E+03

(N2)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 X4JD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
CON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.948E+01	.950E+01	.952E+01	.953E+01	.955E+01	.956E+01	.958E+01
20.	.948E+01	.950E+01	.952E+01	.954E+01	.955E+01	.957E+01	.958E+01
30.	.948E+01	.950E+01	.952E+01	.954E+01	.956E+01	.957E+01	.959E+01
40.	.948E+01	.950E+01	.952E+01	.954E+01	.955E+01	.957E+01	.958E+01
50.	.948E+01	.950E+01	.952E+01	.953E+01	.955E+01	.957E+01	.958E+01
60.	.948E+01	.950E+01	.951E+01	.953E+01	.954E+01	.956E+01	.957E+01
70.	.948E+01	.949E+01	.951E+01	.952E+01	.954E+01	.955E+01	.956E+01
80.	.948E+01	.949E+01	.950E+01	.952E+01	.953E+01	.954E+01	.955E+01
90.	.948E+01	.949E+01	.950E+01	.951E+01	.952E+01	.953E+01	.954E+01
100.	.948E+01	.949E+01	.949E+01	.950E+01	.951E+01	.951E+01	.952E+01
110.	.948E+01	.948E+01	.948E+01	.949E+01	.949E+01	.950E+01	.951E+01
120.	.948E+01	.948E+01	.948E+01	.948E+01	.948E+01	.949E+01	.949E+01
130.	.948E+01	.948E+01	.947E+01	.947E+01	.947E+01	.947E+01	.948E+01
140.	.948E+01	.947E+01	.947E+01	.946E+01	.946E+01	.946E+01	.946E+01
150.	.948E+01	.947E+01	.946E+01	.945E+01	.945E+01	.945E+01	.945E+01
160.	.948E+01	.947E+01	.946E+01	.945E+01	.944E+01	.944E+01	.944E+01
170.	.948E+01	.947E+01	.945E+01	.944E+01	.944E+01	.943E+01	.943E+01
180.	.948E+01	.947E+01	.945E+01	.944E+01	.943E+01	.943E+01	.942E+01
190.	.948E+01	.947E+01	.945E+01	.944E+01	.943E+01	.942E+01	.942E+01
200.	.948E+01	.946E+01	.945E+01	.944E+01	.943E+01	.942E+01	.942E+01
210.	.948E+01	.946E+01	.945E+01	.943E+01	.942E+01	.942E+01	.941E+01
220.	.948E+01	.946E+01	.945E+01	.943E+01	.942E+01	.942E+01	.941E+01
230.	.948E+01	.946E+01	.945E+01	.943E+01	.942E+01	.942E+01	.941E+01
240.	.948E+01	.946E+01	.945E+01	.944E+01	.942E+01	.942E+01	.941E+01
250.	.948E+01	.946E+01	.945E+01	.944E+01	.943E+01	.942E+01	.942E+01
260.	.948E+01	.947E+01	.945E+01	.944E+01	.943E+01	.942E+01	.942E+01
270.	.948E+01	.947E+01	.945E+01	.944E+01	.944E+01	.943E+01	.943E+01
280.	.948E+01	.947E+01	.946E+01	.945E+01	.944E+01	.944E+01	.944E+01
290.	.948E+01	.947E+01	.946E+01	.946E+01	.945E+01	.945E+01	.945E+01
300.	.948E+01	.948E+01	.947E+01	.947E+01	.947E+01	.947E+01	.947E+01
310.	.948E+01	.948E+01	.948E+01	.948E+01	.948E+01	.948E+01	.949E+01
320.	.948E+01	.948E+01	.949E+01	.949E+01	.949E+01	.950E+01	.951E+01
330.	.948E+01	.949E+01	.949E+01	.950E+01	.951E+01	.952E+01	.953E+01
340.	.948E+01	.949E+01	.950E+01	.951E+01	.952E+01	.953E+01	.954E+01
350.	.948E+01	.949E+01	.951E+01	.952E+01	.953E+01	.955E+01	.956E+01
360.	.948E+01	.950E+01	.951E+01	.953E+01	.954E+01	.956E+01	.957E+01

(N2)

PAGE 2

R = 1966 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440028 F10 = 100.00 F10B = 100.00 GI = 0.00
 LATITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
ON.							
(-WEST)							
(+EAST)							
10.	.959E+01	.960E+01	.961E+01	.961E+01	.961E+01	.961E+01	.961E+01
20.	.960E+01	.960E+01	.961E+01	.962E+01	.962E+01	.962E+01	.962E+01
30.	.960E+01	.961E+01	.961E+01	.962E+01	.962E+01	.962E+01	.962E+01
40.	.960E+01	.961E+01	.961E+01	.962E+01	.962E+01	.962E+01	.962E+01
50.	.959E+01	.960E+01	.961E+01	.961E+01	.961E+01	.961E+01	.961E+01
60.	.958E+01	.959E+01	.960E+01	.960E+01	.961E+01	.961E+01	.961E+01
70.	.957E+01	.958E+01	.959E+01	.959E+01	.960E+01	.960E+01	.960E+01
80.	.956E+01	.957E+01	.958E+01	.958E+01	.959E+01	.959E+01	.959E+01
90.	.955E+01	.955E+01	.956E+01	.957E+01	.957E+01	.958E+01	.958E+01
100.	.953E+01	.954E+01	.955E+01	.955E+01	.956E+01	.956E+01	.956E+01
110.	.951E+01	.952E+01	.953E+01	.953E+01	.954E+01	.955E+01	.955E+01
120.	.950E+01	.950E+01	.951E+01	.952E+01	.953E+01	.953E+01	.954E+01
130.	.948E+01	.949E+01	.949E+01	.950E+01	.951E+01	.952E+01	.953E+01
140.	.947E+01	.947E+01	.948E+01	.948E+01	.949E+01	.951E+01	.952E+01
150.	.945E+01	.946E+01	.946E+01	.947E+01	.948E+01	.949E+01	.951E+01
160.	.944E+01	.944E+01	.945E+01	.946E+01	.947E+01	.948E+01	.950E+01
170.	.943E+01	.943E+01	.944E+01	.945E+01	.946E+01	.947E+01	.949E+01
180.	.942E+01	.943E+01	.943E+01	.944E+01	.945E+01	.947E+01	.949E+01
190.	.942E+01	.942E+01	.943E+01	.944E+01	.945E+01	.946E+01	.948E+01
200.	.942E+01	.942E+01	.942E+01	.943E+01	.945E+01	.946E+01	.948E+01
210.	.941E+01	.942E+01	.942E+01	.943E+01	.944E+01	.946E+01	.948E+01
220.	.941E+01	.942E+01	.942E+01	.943E+01	.944E+01	.946E+01	.948E+01
230.	.941E+01	.942E+01	.942E+01	.943E+01	.944E+01	.946E+01	.948E+01
240.	.941E+01	.942E+01	.942E+01	.943E+01	.944E+01	.946E+01	.948E+01
250.	.942E+01	.942E+01	.943E+01	.943E+01	.945E+01	.946E+01	.948E+01
260.	.942E+01	.943E+01	.943E+01	.944E+01	.945E+01	.947E+01	.948E+01
270.	.943E+01	.943E+01	.944E+01	.945E+01	.946E+01	.947E+01	.949E+01
280.	.944E+01	.945E+01	.945E+01	.946E+01	.947E+01	.948E+01	.950E+01
290.	.946E+01	.946E+01	.947E+01	.948E+01	.949E+01	.950E+01	.951E+01
300.	.948E+01	.948E+01	.949E+01	.950E+01	.950E+01	.951E+01	.952E+01
310.	.950E+01	.950E+01	.951E+01	.952E+01	.952E+01	.953E+01	.954E+01
320.	.952E+01	.952E+01	.953E+01	.954E+01	.954E+01	.955E+01	.955E+01
330.	.954E+01	.954E+01	.955E+01	.956E+01	.956E+01	.957E+01	.957E+01
340.	.955E+01	.956E+01	.957E+01	.957E+01	.958E+01	.958E+01	.958E+01
350.	.957E+01	.958E+01	.958E+01	.959E+01	.959E+01	.960E+01	.959E+01
360.	.958E+01	.959E+01	.960E+01	.960E+01	.961E+01	.961E+01	.960E+01

(N2)

PAGE

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
MJD = 2440020. F10 = 100.00 F10B = 100.00 GI = 0.00
ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)				
LONG.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	.961E+01	.960E+01	.959E+01	.958E+01	.957E+01
20.	.961E+01	.960E+01	.959E+01	.958E+01	.957E+01
30.	.961E+01	.960E+01	.959E+01	.958E+01	.957E+01
40.	.961E+01	.960E+01	.959E+01	.958E+01	.957E+01
50.	.961E+01	.960E+01	.959E+01	.958E+01	.957E+01
60.	.960E+01	.960E+01	.959E+01	.958E+01	.957E+01
70.	.960E+01	.959E+01	.958E+01	.958E+01	.957E+01
80.	.959E+01	.958E+01	.958E+01	.957E+01	.957E+01
90.	.958E+01	.958E+01	.957E+01	.957E+01	.957E+01
100.	.957E+01	.957E+01	.957E+01	.957E+01	.957E+01
110.	.956E+01	.956E+01	.956E+01	.957E+01	.957E+01
120.	.955E+01	.955E+01	.956E+01	.956E+01	.957E+01
130.	.954E+01	.954E+01	.955E+01	.956E+01	.957E+01
140.	.953E+01	.954E+01	.955E+01	.956E+01	.957E+01
150.	.952E+01	.953E+01	.954E+01	.956E+01	.957E+01
160.	.951E+01	.953E+01	.954E+01	.955E+01	.957E+01
170.	.950E+01	.952E+01	.954E+01	.955E+01	.957E+01
180.	.950E+01	.952E+01	.954E+01	.955E+01	.957E+01
190.	.950E+01	.952E+01	.953E+01	.955E+01	.957E+01
200.	.950E+01	.951E+01	.953E+01	.955E+01	.957E+01
210.	.950E+01	.951E+01	.953E+01	.955E+01	.957E+01
220.	.949E+01	.951E+01	.953E+01	.955E+01	.957E+01
230.	.949E+01	.951E+01	.953E+01	.955E+01	.957E+01
240.	.950E+01	.951E+01	.953E+01	.955E+01	.957E+01
250.	.950E+01	.952E+01	.953E+01	.955E+01	.957E+01
260.	.950E+01	.952E+01	.953E+01	.955E+01	.957E+01
270.	.951E+01	.952E+01	.954E+01	.955E+01	.957E+01
280.	.951E+01	.953E+01	.954E+01	.955E+01	.957E+01
290.	.952E+01	.953E+01	.955E+01	.956E+01	.957E+01
300.	.953E+01	.954E+01	.955E+01	.956E+01	.957E+01
310.	.954E+01	.955E+01	.956E+01	.956E+01	.957E+01
320.	.956E+01	.956E+01	.956E+01	.957E+01	.957E+01
330.	.957E+01	.957E+01	.957E+01	.957E+01	.957E+01
340.	.958E+01	.958E+01	.958E+01	.957E+01	.957E+01
350.	.959E+01	.959E+01	.958E+01	.958E+01	.957E+01
360.	.960E+01	.960E+01	.959E+01	.958E+01	.957E+01

(02)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XHJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
CON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.838E+01	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01	.850E+01
20.	.838E+01	.840E+01	.842E+01	.845E+01	.847E+01	.849E+01	.850E+01
30.	.838E+01	.840E+01	.843E+01	.845E+01	.847E+01	.849E+01	.850E+01
40.	.838E+01	.840E+01	.842E+01	.845E+01	.847E+01	.849E+01	.850E+01
50.	.838E+01	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01	.850E+01
60.	.838E+01	.840E+01	.842E+01	.844E+01	.846E+01	.847E+01	.849E+01
70.	.838E+01	.840E+01	.841E+01	.843E+01	.845E+01	.846E+01	.848E+01
80.	.838E+01	.839E+01	.841E+01	.842E+01	.844E+01	.845E+01	.846E+01
90.	.838E+01	.839E+01	.840E+01	.841E+01	.842E+01	.843E+01	.845E+01
100.	.838E+01	.838E+01	.839E+01	.840E+01	.841E+01	.842E+01	.843E+01
110.	.838E+01	.838E+01	.838E+01	.839E+01	.839E+01	.840E+01	.841E+01
120.	.838E+01	.838E+01	.838E+01	.838E+01	.838E+01	.839E+01	.839E+01
130.	.838E+01	.837E+01	.837E+01	.837E+01	.837E+01	.837E+01	.837E+01
140.	.838E+01	.837E+01	.836E+01	.836E+01	.835E+01	.835E+01	.836E+01
150.	.837E+01	.837E+01	.836E+01	.835E+01	.834E+01	.834E+01	.834E+01
160.	.838E+01	.836E+01	.835E+01	.834E+01	.833E+01	.833E+01	.833E+01
170.	.838E+01	.836E+01	.835E+01	.833E+01	.832E+01	.832E+01	.832E+01
180.	.838E+01	.836E+01	.834E+01	.833E+01	.832E+01	.831E+01	.831E+01
190.	.838E+01	.836E+01	.834E+01	.833E+01	.831E+01	.831E+01	.830E+01
200.	.838E+01	.836E+01	.834E+01	.832E+01	.831E+01	.830E+01	.830E+01
210.	.838E+01	.836E+01	.834E+01	.832E+01	.831E+01	.830E+01	.830E+01
220.	.838E+01	.836E+01	.834E+01	.832E+01	.831E+01	.830E+01	.830E+01
230.	.838E+01	.836E+01	.834E+01	.832E+01	.831E+01	.830E+01	.830E+01
240.	.838E+01	.836E+01	.834E+01	.832E+01	.831E+01	.830E+01	.830E+01
250.	.838E+01	.836E+01	.834E+01	.833E+01	.831E+01	.831E+01	.830E+01
260.	.838E+01	.836E+01	.834E+01	.833E+01	.832E+01	.831E+01	.831E+01
270.	.838E+01	.836E+01	.835E+01	.833E+01	.832E+01	.832E+01	.832E+01
280.	.838E+01	.836E+01	.835E+01	.834E+01	.833E+01	.833E+01	.833E+01
290.	.838E+01	.837E+01	.836E+01	.835E+01	.835E+01	.835E+01	.835E+01
300.	.838E+01	.837E+01	.837E+01	.836E+01	.836E+01	.836E+01	.837E+01
310.	.838E+01	.838E+01	.837E+01	.838E+01	.838E+01	.838E+01	.839E+01
320.	.838E+01	.838E+01	.838E+01	.839E+01	.840E+01	.840E+01	.841E+01
330.	.838E+01	.839E+01	.839E+01	.840E+01	.841E+01	.842E+01	.843E+01
340.	.838E+01	.839E+01	.840E+01	.842E+01	.843E+01	.844E+01	.845E+01
350.	.838E+01	.839E+01	.841E+01	.843E+01	.844E+01	.846E+01	.847E+01
360.	.838E+01	.840E+01	.842E+01	.844E+01	.845E+01	.847E+01	.849E+01

(02)

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YR = 1966 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XJD = 2440028. F10 = 100.00 F10B = 100.00 CI = 0.00
 ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG.	-20.	-10.	0.	10.	20.	30.	40.
(-WEST) (+EAST)							
10.	.851E+01	.852E+01	.853E+01	.854E+01	.854E+01	.854E+01	.854E+01
20.	.852E+01	.853E+01	.854E+01	.854E+01	.855E+01	.855E+01	.854E+01
30.	.852E+01	.853E+01	.854E+01	.855E+01	.855E+01	.855E+01	.854E+01
40.	.852E+01	.853E+01	.854E+01	.854E+01	.855E+01	.855E+01	.854E+01
50.	.851E+01	.852E+01	.853E+01	.854E+01	.854E+01	.854E+01	.854E+01
60.	.850E+01	.851E+01	.852E+01	.853E+01	.853E+01	.853E+01	.853E+01
70.	.849E+01	.850E+01	.851E+01	.852E+01	.852E+01	.852E+01	.852E+01
80.	.847E+01	.849E+01	.849E+01	.850E+01	.851E+01	.851E+01	.851E+01
90.	.846E+01	.847E+01	.848E+01	.848E+01	.849E+01	.849E+01	.849E+01
100.	.844E+01	.845E+01	.846E+01	.846E+01	.847E+01	.848E+01	.848E+01
110.	.842E+01	.843E+01	.844E+01	.844E+01	.845E+01	.846E+01	.847E+01
120.	.840E+01	.841E+01	.842E+01	.842E+01	.843E+01	.844E+01	.845E+01
130.	.838E+01	.839E+01	.839E+01	.840E+01	.841E+01	.842E+01	.843E+01
140.	.836E+01	.837E+01	.838E+01	.838E+01	.840E+01	.841E+01	.842E+01
150.	.835E+01	.835E+01	.836E+01	.837E+01	.838E+01	.839E+01	.841E+01
160.	.833E+01	.834E+01	.834E+01	.835E+01	.837E+01	.838E+01	.840E+01
170.	.832E+01	.832E+01	.833E+01	.834E+01	.835E+01	.837E+01	.839E+01
180.	.831E+01	.831E+01	.832E+01	.833E+01	.835E+01	.836E+01	.836E+01
190.	.830E+01	.831E+01	.831E+01	.833E+01	.834E+01	.836E+01	.838E+01
200.	.830E+01	.830E+01	.831E+01	.832E+01	.834E+01	.835E+01	.837E+01
210.	.830E+01	.830E+01	.831E+01	.832E+01	.833E+01	.835E+01	.837E+01
220.	.830E+01	.830E+01	.831E+01	.832E+01	.833E+01	.835E+01	.837E+01
230.	.830E+01	.830E+01	.831E+01	.832E+01	.833E+01	.835E+01	.837E+01
240.	.830E+01	.830E+01	.831E+01	.832E+01	.834E+01	.835E+01	.837E+01
250.	.830E+01	.831E+01	.831E+01	.832E+01	.834E+01	.836E+01	.838E+01
260.	.831E+01	.831E+01	.832E+01	.833E+01	.834E+01	.836E+01	.838E+01
270.	.832E+01	.832E+01	.833E+01	.834E+01	.835E+01	.837E+01	.839E+01
280.	.833E+01	.834E+01	.835E+01	.836E+01	.837E+01	.838E+01	.840E+01
290.	.835E+01	.836E+01	.836E+01	.837E+01	.839E+01	.840E+01	.841E+01
300.	.837E+01	.838E+01	.839E+01	.840E+01	.841E+01	.842E+01	.843E+01
310.	.840E+01	.840E+01	.841E+01	.842E+01	.843E+01	.844E+01	.845E+01
320.	.842E+01	.843E+01	.844E+01	.845E+01	.845E+01	.846E+01	.847E+01
330.	.844E+01	.845E+01	.846E+01	.847E+01	.848E+01	.848E+01	.848E+01
340.	.847E+01	.848E+01	.848E+01	.849E+01	.850E+01	.850E+01	.850E+01
350.	.848E+01	.850E+01	.850E+01	.851E+01	.851E+01	.852E+01	.852E+01
360.	.850E+01	.851E+01	.852E+01	.853E+01	.853E+01	.853E+01	.853E+01

(02)

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R = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
MJD = 2440026. F10 = 100.00 F10B = 100.00 CI = 0.00
LATITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)				
ON.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	.853E+01	.852E+01	.851E+01	.850E+01	.849E+01
20.	.854E+01	.853E+01	.851E+01	.850E+01	.848E+01
30.	.854E+01	.853E+01	.851E+01	.850E+01	.848E+01
40.	.854E+01	.853E+01	.851E+01	.850E+01	.848E+01
50.	.853E+01	.852E+01	.851E+01	.850E+01	.848E+01
60.	.853E+01	.852E+01	.851E+01	.850E+01	.848E+01
70.	.852E+01	.851E+01	.850E+01	.849E+01	.848E+01
80.	.851E+01	.850E+01	.850E+01	.849E+01	.848E+01
90.	.850E+01	.849E+01	.849E+01	.849E+01	.848E+01
100.	.848E+01	.848E+01	.849E+01	.849E+01	.848E+01
110.	.847E+01	.848E+01	.848E+01	.848E+01	.848E+01
120.	.846E+01	.847E+01	.847E+01	.848E+01	.848E+01
130.	.845E+01	.846E+01	.847E+01	.847E+01	.848E+01
140.	.843E+01	.845E+01	.846E+01	.847E+01	.848E+01
150.	.842E+01	.844E+01	.845E+01	.847E+01	.848E+01
160.	.842E+01	.843E+01	.845E+01	.847E+01	.848E+01
170.	.841E+01	.843E+01	.845E+01	.847E+01	.848E+01
180.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
190.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
200.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
210.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
220.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
230.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
240.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
250.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
260.	.840E+01	.842E+01	.844E+01	.846E+01	.848E+01
270.	.841E+01	.843E+01	.845E+01	.847E+01	.848E+01
280.	.842E+01	.843E+01	.845E+01	.847E+01	.848E+01
290.	.843E+01	.844E+01	.846E+01	.847E+01	.848E+01
300.	.844E+01	.845E+01	.846E+01	.847E+01	.848E+01
310.	.846E+01	.846E+01	.847E+01	.848E+01	.848E+01
320.	.847E+01	.848E+01	.848E+01	.848E+01	.848E+01
330.	.849E+01	.849E+01	.849E+01	.849E+01	.848E+01
340.	.850E+01	.850E+01	.849E+01	.849E+01	.848E+01
350.	.851E+01	.851E+01	.850E+01	.849E+01	.848E+01
360.	.852E+01	.852E+01	.851E+01	.850E+01	.848E+01

(0)

PAGE

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
XNJD = 2440020. F10 = 100.00 F10B = 100.00 CI = 0.00
ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)						
LON.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.983E+01	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01	.987E+01
20.	.983E+01	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01	.987E+01
30.	.983E+01	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01	.987E+01
40.	.983E+01	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01	.987E+01
50.	.983E+01	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01	.987E+01
60.	.983E+01	.984E+01	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
70.	.983E+01	.983E+01	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
80.	.983E+01	.983E+01	.984E+01	.984E+01	.985E+01	.985E+01	.986E+01
90.	.983E+01	.983E+01	.984E+01	.984E+01	.984E+01	.985E+01	.985E+01
100.	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01	.984E+01	.984E+01
110.	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01
120.	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01
130.	.983E+01	.983E+01	.983E+01	.982E+01	.982E+01	.983E+01	.983E+01
140.	.983E+01	.983E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01
150.	.983E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01
160.	.983E+01	.982E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01
170.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01	.981E+01
180.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01	.981E+01
190.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
200.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
210.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
220.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
230.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
240.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
250.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.980E+01	.980E+01
260.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01	.980E+01
270.	.983E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01	.981E+01
280.	.983E+01	.982E+01	.982E+01	.982E+01	.981E+01	.981E+01	.981E+01
290.	.983E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01
300.	.983E+01	.983E+01	.982E+01	.982E+01	.982E+01	.982E+01	.982E+01
310.	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01
320.	.983E+01	.983E+01	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01
330.	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01	.984E+01	.985E+01
340.	.983E+01	.983E+01	.984E+01	.984E+01	.984E+01	.985E+01	.985E+01
350.	.983E+01	.983E+01	.984E+01	.984E+01	.985E+01	.985E+01	.986E+01
360.	.983E+01	.983E+01	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01

(0)

PAGE 2

YR = 1960 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 AMJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 165.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.987E+01	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01
20.	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01
30.	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01
40.	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01
50.	.987E+01	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01	.988E+01
60.	.987E+01	.987E+01	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01
70.	.986E+01	.987E+01	.987E+01	.987E+01	.987E+01	.987E+01	.987E+01
80.	.986E+01	.986E+01	.987E+01	.987E+01	.987E+01	.987E+01	.987E+01
90.	.985E+01	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01	.987E+01
100.	.985E+01	.985E+01	.985E+01	.986E+01	.986E+01	.986E+01	.986E+01
110.	.984E+01	.984E+01	.985E+01	.985E+01	.985E+01	.985E+01	.986E+01
120.	.984E+01	.984E+01	.984E+01	.984E+01	.985E+01	.985E+01	.985E+01
130.	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01	.984E+01	.985E+01
140.	.982E+01	.982E+01	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01
150.	.982E+01	.982E+01	.982E+01	.982E+01	.983E+01	.983E+01	.984E+01
160.	.981E+01	.981E+01	.982E+01	.982E+01	.982E+01	.983E+01	.983E+01
170.	.981E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01	.983E+01
180.	.981E+01	.981E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01
190.	.980E+01	.980E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01
200.	.980E+01	.980E+01	.981E+01	.981E+01	.981E+01	.982E+01	.983E+01
210.	.980E+01	.980E+01	.980E+01	.981E+01	.981E+01	.982E+01	.983E+01
220.	.980E+01	.980E+01	.980E+01	.981E+01	.981E+01	.982E+01	.983E+01
230.	.980E+01	.980E+01	.980E+01	.981E+01	.981E+01	.982E+01	.983E+01
240.	.980E+01	.980E+01	.981E+01	.981E+01	.981E+01	.982E+01	.983E+01
250.	.980E+01	.980E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01
260.	.981E+01	.981E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01
270.	.981E+01	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01	.983E+01
280.	.981E+01	.981E+01	.982E+01	.982E+01	.983E+01	.983E+01	.984E+01
290.	.982E+01	.982E+01	.982E+01	.983E+01	.983E+01	.984E+01	.984E+01
300.	.983E+01	.983E+01	.983E+01	.983E+01	.984E+01	.984E+01	.985E+01
310.	.983E+01	.984E+01	.984E+01	.984E+01	.985E+01	.985E+01	.985E+01
320.	.984E+01	.985E+01	.985E+01	.985E+01	.985E+01	.985E+01	.986E+01
330.	.985E+01	.985E+01	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01
340.	.986E+01	.986E+01	.986E+01	.986E+01	.987E+01	.987E+01	.987E+01
350.	.986E+01	.987E+01	.987E+01	.987E+01	.987E+01	.987E+01	.987E+01
360.	.987E+01	.987E+01	.987E+01	.988E+01	.988E+01	.988E+01	.988E+01

(0)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
MJD = 2440020. F10 = 100.00 F100 = 100.00 G1 = 0.00
ALTITUDE = 105.0

CON.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	.988E+01	.987E+01	.987E+01	.987E+01	.986E+01
20.	.988E+01	.986E+01	.987E+01	.987E+01	.986E+01
30.	.988E+01	.986E+01	.987E+01	.987E+01	.986E+01
40.	.988E+01	.986E+01	.987E+01	.987E+01	.986E+01
50.	.988E+01	.987E+01	.987E+01	.987E+01	.986E+01
60.	.988E+01	.987E+01	.987E+01	.987E+01	.986E+01
70.	.987E+01	.987E+01	.987E+01	.987E+01	.986E+01
80.	.987E+01	.987E+01	.987E+01	.986E+01	.986E+01
90.	.987E+01	.987E+01	.986E+01	.986E+01	.986E+01
100.	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01
110.	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01
120.	.985E+01	.986E+01	.986E+01	.986E+01	.986E+01
130.	.985E+01	.985E+01	.986E+01	.986E+01	.986E+01
140.	.985E+01	.985E+01	.985E+01	.986E+01	.986E+01
150.	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
160.	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
170.	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01
180.	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01
190.	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01
200.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
210.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
220.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
230.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
240.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
250.	.983E+01	.984E+01	.985E+01	.986E+01	.986E+01
260.	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01
270.	.984E+01	.984E+01	.985E+01	.986E+01	.986E+01
280.	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
290.	.984E+01	.985E+01	.985E+01	.986E+01	.986E+01
300.	.985E+01	.985E+01	.986E+01	.986E+01	.986E+01
310.	.985E+01	.986E+01	.986E+01	.986E+01	.986E+01
320.	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01
330.	.986E+01	.986E+01	.986E+01	.986E+01	.986E+01
340.	.987E+01	.987E+01	.987E+01	.986E+01	.986E+01
350.	.987E+01	.987E+01	.987E+01	.987E+01	.986E+01
360.	.987E+01	.987E+01	.987E+01	.987E+01	.986E+01

(A)

PAGE 1

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440029. F10 = 100.00 F100 = 100.00 G1 = 0.00
 ALTITUDE = 105.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-90.	-80.	-70.	-60.	-50.	-40.	-30.
10.	.631E+01	.634E+01	.636E+01	.639E+01	.642E+01	.644E+01	.646E+01
20.	.631E+01	.634E+01	.637E+01	.640E+01	.642E+01	.645E+01	.647E+01
30.	.631E+01	.634E+01	.637E+01	.640E+01	.643E+01	.645E+01	.648E+01
40.	.631E+01	.634E+01	.637E+01	.640E+01	.642E+01	.645E+01	.647E+01
50.	.631E+01	.634E+01	.636E+01	.639E+01	.642E+01	.644E+01	.647E+01
60.	.631E+01	.633E+01	.636E+01	.638E+01	.641E+01	.643E+01	.645E+01
70.	.631E+01	.633E+01	.635E+01	.637E+01	.640E+01	.642E+01	.644E+01
80.	.631E+01	.632E+01	.634E+01	.636E+01	.638E+01	.640E+01	.642E+01
90.	.631E+01	.632E+01	.633E+01	.635E+01	.636E+01	.638E+01	.640E+01
100.	.631E+01	.631E+01	.632E+01	.633E+01	.635E+01	.636E+01	.637E+01
110.	.631E+01	.631E+01	.631E+01	.632E+01	.633E+01	.634E+01	.635E+01
120.	.631E+01	.630E+01	.630E+01	.630E+01	.631E+01	.632E+01	.632E+01
130.	.631E+01	.630E+01	.629E+01	.629E+01	.629E+01	.629E+01	.630E+01
140.	.631E+01	.629E+01	.628E+01	.628E+01	.627E+01	.627E+01	.628E+01
150.	.631E+01	.629E+01	.628E+01	.626E+01	.626E+01	.626E+01	.626E+01
160.	.631E+01	.629E+01	.627E+01	.626E+01	.625E+01	.624E+01	.624E+01
170.	.631E+01	.628E+01	.626E+01	.625E+01	.623E+01	.623E+01	.623E+01
180.	.631E+01	.628E+01	.626E+01	.624E+01	.623E+01	.622E+01	.621E+01
190.	.631E+01	.628E+01	.626E+01	.624E+01	.622E+01	.621E+01	.621E+01
200.	.631E+01	.628E+01	.626E+01	.623E+01	.622E+01	.621E+01	.620E+01
210.	.631E+01	.628E+01	.625E+01	.623E+01	.622E+01	.621E+01	.620E+01
220.	.631E+01	.628E+01	.625E+01	.623E+01	.622E+01	.621E+01	.620E+01
230.	.631E+01	.628E+01	.625E+01	.623E+01	.622E+01	.621E+01	.620E+01
240.	.631E+01	.628E+01	.626E+01	.623E+01	.622E+01	.621E+01	.620E+01
250.	.631E+01	.628E+01	.626E+01	.624E+01	.622E+01	.621E+01	.621E+01
260.	.631E+01	.628E+01	.626E+01	.624E+01	.623E+01	.622E+01	.621E+01
270.	.631E+01	.628E+01	.626E+01	.625E+01	.623E+01	.623E+01	.623E+01
280.	.631E+01	.629E+01	.627E+01	.626E+01	.625E+01	.624E+01	.624E+01
290.	.631E+01	.629E+01	.628E+01	.627E+01	.626E+01	.626E+01	.627E+01
300.	.631E+01	.630E+01	.629E+01	.628E+01	.628E+01	.629E+01	.629E+01
310.	.631E+01	.630E+01	.630E+01	.630E+01	.631E+01	.631E+01	.632E+01
320.	.631E+01	.631E+01	.631E+01	.632E+01	.633E+01	.634E+01	.635E+01
330.	.631E+01	.632E+01	.633E+01	.634E+01	.635E+01	.637E+01	.638E+01
340.	.631E+01	.632E+01	.634E+01	.636E+01	.637E+01	.639E+01	.641E+01
350.	.631E+01	.633E+01	.635E+01	.637E+01	.639E+01	.641E+01	.643E+01
360.	.631E+01	.633E+01	.636E+01	.638E+01	.641E+01	.643E+01	.645E+01

(A)

PAGE 2

YR = 1968 DAY = 28 MONTH = 6 HOUR = 12 MIN = 0
 XHJD = 2440020. F10 = 100.00 F10B = 100.00 G1 = 0.00
 ALTITUDE = 105.0

LON. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)						
	-20.	-10.	0.	10.	20.	30.	40.
10.	.648E+01	.650E+01	.651E+01	.652E+01	.652E+01	.652E+01	.652E+01
20.	.649E+01	.651E+01	.652E+01	.653E+01	.653E+01	.653E+01	.652E+01
30.	.649E+01	.651E+01	.652E+01	.653E+01	.653E+01	.653E+01	.653E+01
40.	.649E+01	.651E+01	.652E+01	.653E+01	.653E+01	.653E+01	.653E+01
50.	.648E+01	.650E+01	.651E+01	.652E+01	.652E+01	.652E+01	.652E+01
60.	.647E+01	.649E+01	.650E+01	.651E+01	.651E+01	.651E+01	.651E+01
70.	.646E+01	.647E+01	.648E+01	.649E+01	.649E+01	.650E+01	.650E+01
80.	.643E+01	.645E+01	.646E+01	.647E+01	.648E+01	.648E+01	.648E+01
90.	.641E+01	.643E+01	.644E+01	.645E+01	.645E+01	.646E+01	.646E+01
100.	.639E+01	.640E+01	.641E+01	.642E+01	.643E+01	.644E+01	.644E+01
110.	.636E+01	.637E+01	.638E+01	.639E+01	.640E+01	.641E+01	.642E+01
120.	.633E+01	.634E+01	.636E+01	.637E+01	.638E+01	.639E+01	.640E+01
130.	.631E+01	.632E+01	.633E+01	.634E+01	.635E+01	.637E+01	.638E+01
140.	.628E+01	.629E+01	.630E+01	.631E+01	.633E+01	.635E+01	.636E+01
150.	.626E+01	.627E+01	.628E+01	.629E+01	.631E+01	.633E+01	.635E+01
160.	.624E+01	.625E+01	.626E+01	.627E+01	.629E+01	.631E+01	.633E+01
170.	.623E+01	.623E+01	.624E+01	.626E+01	.627E+01	.630E+01	.632E+01
180.	.621E+01	.622E+01	.623E+01	.624E+01	.626E+01	.629E+01	.631E+01
190.	.621E+01	.621E+01	.622E+01	.623E+01	.625E+01	.628E+01	.630E+01
200.	.620E+01	.621E+01	.622E+01	.623E+01	.625E+01	.627E+01	.630E+01
210.	.620E+01	.620E+01	.621E+01	.623E+01	.625E+01	.627E+01	.630E+01
220.	.620E+01	.620E+01	.621E+01	.623E+01	.625E+01	.627E+01	.630E+01
230.	.620E+01	.620E+01	.621E+01	.623E+01	.625E+01	.627E+01	.630E+01
240.	.620E+01	.620E+01	.621E+01	.623E+01	.625E+01	.627E+01	.630E+01
250.	.621E+01	.621E+01	.622E+01	.623E+01	.625E+01	.628E+01	.630E+01
260.	.621E+01	.622E+01	.623E+01	.624E+01	.626E+01	.628E+01	.631E+01
270.	.623E+01	.623E+01	.624E+01	.626E+01	.627E+01	.630E+01	.632E+01
280.	.625E+01	.625E+01	.626E+01	.628E+01	.629E+01	.631E+01	.633E+01
290.	.627E+01	.628E+01	.629E+01	.630E+01	.632E+01	.633E+01	.635E+01
300.	.630E+01	.631E+01	.632E+01	.633E+01	.634E+01	.636E+01	.637E+01
310.	.633E+01	.634E+01	.635E+01	.636E+01	.637E+01	.639E+01	.640E+01
320.	.636E+01	.637E+01	.639E+01	.640E+01	.641E+01	.642E+01	.642E+01
330.	.639E+01	.641E+01	.642E+01	.643E+01	.644E+01	.644E+01	.645E+01
340.	.642E+01	.644E+01	.645E+01	.646E+01	.646E+01	.647E+01	.647E+01
350.	.645E+01	.646E+01	.647E+01	.648E+01	.649E+01	.649E+01	.649E+01
360.	.647E+01	.648E+01	.649E+01	.650E+01	.651E+01	.651E+01	.651E+01

(A)

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 XMJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
 ALTITUDE = 185.0

(-SOUTH) LATITUDES (+NORTH)
 LON. 50. 60. 70. 80. 90.
 (-WEST)
 (+EAST)

10.	.651E+01	.650E+01	.648E+01	.647E+01	.644E+01
20.	.652E+01	.650E+01	.649E+01	.647E+01	.644E+01
30.	.652E+01	.651E+01	.649E+01	.647E+01	.644E+01
40.	.652E+01	.650E+01	.649E+01	.647E+01	.644E+01
50.	.651E+01	.650E+01	.648E+01	.647E+01	.644E+01
60.	.650E+01	.649E+01	.648E+01	.646E+01	.644E+01
70.	.649E+01	.648E+01	.647E+01	.646E+01	.644E+01
80.	.648E+01	.647E+01	.647E+01	.646E+01	.644E+01
90.	.646E+01	.646E+01	.646E+01	.645E+01	.644E+01
100.	.645E+01	.645E+01	.645E+01	.645E+01	.644E+01
110.	.643E+01	.644E+01	.644E+01	.644E+01	.644E+01
120.	.641E+01	.642E+01	.643E+01	.644E+01	.644E+01
130.	.640E+01	.641E+01	.642E+01	.643E+01	.644E+01
140.	.638E+01	.640E+01	.641E+01	.643E+01	.644E+01
150.	.637E+01	.639E+01	.641E+01	.643E+01	.644E+01
160.	.635E+01	.638E+01	.640E+01	.642E+01	.644E+01
170.	.635E+01	.637E+01	.640E+01	.642E+01	.644E+01
180.	.634E+01	.637E+01	.639E+01	.642E+01	.644E+01
190.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
200.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
210.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
220.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
230.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
240.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
250.	.633E+01	.636E+01	.639E+01	.642E+01	.644E+01
260.	.634E+01	.637E+01	.639E+01	.642E+01	.644E+01
270.	.635E+01	.637E+01	.640E+01	.642E+01	.644E+01
280.	.636E+01	.638E+01	.640E+01	.642E+01	.644E+01
290.	.637E+01	.639E+01	.641E+01	.643E+01	.644E+01
300.	.639E+01	.641E+01	.642E+01	.643E+01	.644E+01
310.	.641E+01	.642E+01	.643E+01	.644E+01	.644E+01
320.	.643E+01	.644E+01	.644E+01	.644E+01	.644E+01
330.	.645E+01	.645E+01	.645E+01	.645E+01	.644E+01
340.	.647E+01	.647E+01	.646E+01	.645E+01	.644E+01
350.	.649E+01	.648E+01	.647E+01	.646E+01	.644E+01
360.	.650E+01	.649E+01	.648E+01	.646E+01	.644E+01

(HE)

PAGE

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
AMJD = 2440028. F10 = 100.00 F10B = 100.00 G1 = 0.00
ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
LOH.	-90.	-80.	-70.	-60.	-50.	-40.	-30.
(-WEST)							
(+EAST)							
10.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
20.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
30.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
40.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
50.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
60.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
70.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
80.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
90.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
100.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
110.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
120.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
130.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
140.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
150.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
160.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
170.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
180.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
190.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
200.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
210.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
220.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
230.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
240.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
250.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
260.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
270.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
280.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
290.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
300.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
310.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
320.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
330.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01
340.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01
350.	.710E+01	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
360.	.710E+01	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01

[illegible]

(HE)

PAGE :

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
XNJD = 2440028, F10 = 100.00 F108 = 100.00 GI = 0.00
ALTITUDE = 185.0

(-SOUTH) LATITUDES (+NORTH)
LON. 50. 60. 70. 80. 90.
(-WEST)
(+EAST)

10.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
20.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
30.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
40.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
50.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
60.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
70.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
80.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
90.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
100.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
110.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
120.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
130.	.710E+01	.709E+01	.709E+01	.709E+01	.709E+01
140.	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
150.	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
160.	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
170.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
180.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
190.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
200.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
210.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
220.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
230.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
240.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
250.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
260.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
270.	.710E+01	.710E+01	.710E+01	.709E+01	.709E+01
280.	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
290.	.710E+01	.710E+01	.709E+01	.709E+01	.709E+01
300.	.710E+01	.709E+01	.709E+01	.709E+01	.709E+01
310.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
320.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
330.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
340.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
350.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01
360.	.709E+01	.709E+01	.709E+01	.709E+01	.709E+01

MEAN MOL WT

PAGE 1

R = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
MJD = 2440026. F10 = 100.00 F108 = 100.00 G1 = 0.00
LATITUDE = 185.0

ON.	-90.	-80.	(-SOUTH) LATITUDES (+NORTH)	-70.	-60.	-50.	-40.	-30.
-WEST)								
+EAST)								
10.	.200E+02	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02	.204E+02	.204E+02
20.	.200E+02	.201E+02	.202E+02	.202E+02	.203E+02	.204E+02	.204E+02	.204E+02
30.	.200E+02	.201E+02	.202E+02	.202E+02	.203E+02	.204E+02	.204E+02	.204E+02
40.	.200E+02	.201E+02	.202E+02	.202E+02	.203E+02	.204E+02	.204E+02	.204E+02
50.	.200E+02	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02	.204E+02	.204E+02
60.	.200E+02	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02	.204E+02	.204E+02
70.	.200E+02	.201E+02	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02
80.	.200E+02	.200E+02	.201E+02	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
90.	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.202E+02	.202E+02	.202E+02
00.	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.202E+02	.202E+02
10.	.200E+02	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.201E+02
20.	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02
30.	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02
40.	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02
50.	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02
60.	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02
70.	.200E+02	.199E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02
80.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02	.198E+02
90.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02	.198E+02
00.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.197E+02	.197E+02
10.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.197E+02	.197E+02
20.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.197E+02	.197E+02
30.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.197E+02	.197E+02
40.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.197E+02	.197E+02
50.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02	.198E+02
60.	.200E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02	.198E+02
70.	.200E+02	.199E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02	.198E+02
80.	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.198E+02	.198E+02	.198E+02
90.	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02	.199E+02
00.	.200E+02	.200E+02	.200E+02	.199E+02	.199E+02	.199E+02	.200E+02	.200E+02
10.	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02	.200E+02
20.	.200E+02	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.201E+02
30.	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.202E+02	.202E+02
40.	.200E+02	.200E+02	.201E+02	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
50.	.200E+02	.201E+02	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02
60.	.200E+02	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02	.204E+02	.204E+02

MEAN MOL WT

PAGE 2

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
XNJD = 2440028. F10 = 100.00 F10B = 100.00 GI = 0.00
ALTITUDE = 185.0

	(-SOUTH) LATITUDES (+NORTH)						
LONG. (-WEST) (+EAST)	-20.	-10.	0.	10.	20.	30.	40.
10.	.204E+02	.205E+02	.205E+02	.205E+02	.206E+02	.206E+02	.205E+02
20.	.205E+02	.205E+02	.205E+02	.206E+02	.206E+02	.206E+02	.206E+02
30.	.205E+02	.205E+02	.206E+02	.206E+02	.206E+02	.206E+02	.206E+02
40.	.205E+02	.205E+02	.205E+02	.206E+02	.206E+02	.206E+02	.206E+02
50.	.205E+02	.205E+02	.205E+02	.205E+02	.206E+02	.206E+02	.205E+02
60.	.204E+02	.205E+02	.205E+02	.205E+02	.205E+02	.205E+02	.205E+02
70.	.204E+02	.204E+02	.204E+02	.205E+02	.205E+02	.205E+02	.205E+02
80.	.203E+02	.204E+02	.204E+02	.204E+02	.204E+02	.204E+02	.204E+02
90.	.203E+02	.203E+02	.203E+02	.204E+02	.204E+02	.204E+02	.204E+02
100.	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02
110.	.201E+02	.202E+02	.202E+02	.202E+02	.202E+02	.203E+02	.203E+02
120.	.201E+02	.201E+02	.201E+02	.201E+02	.202E+02	.202E+02	.202E+02
130.	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.201E+02	.202E+02
140.	.199E+02	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02
150.	.199E+02	.199E+02	.199E+02	.200E+02	.200E+02	.200E+02	.201E+02
160.	.198E+02	.199E+02	.199E+02	.199E+02	.200E+02	.200E+02	.201E+02
170.	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02	.200E+02
180.	.198E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
190.	.198E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
200.	.197E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
210.	.197E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
220.	.197E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
230.	.197E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
240.	.197E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
250.	.198E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
260.	.198E+02	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02
270.	.198E+02	.198E+02	.198E+02	.199E+02	.199E+02	.200E+02	.200E+02
280.	.199E+02	.199E+02	.199E+02	.199E+02	.200E+02	.200E+02	.201E+02
290.	.199E+02	.199E+02	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02
300.	.200E+02	.200E+02	.200E+02	.201E+02	.201E+02	.201E+02	.202E+02
310.	.201E+02	.201E+02	.201E+02	.201E+02	.202E+02	.202E+02	.202E+02
320.	.201E+02	.202E+02	.202E+02	.202E+02	.202E+02	.203E+02	.203E+02
330.	.202E+02	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02	.204E+02
340.	.203E+02	.203E+02	.204E+02	.204E+02	.204E+02	.204E+02	.204E+02
350.	.204E+02	.204E+02	.204E+02	.204E+02	.205E+02	.205E+02	.205E+02
360.	.204E+02	.205E+02	.205E+02	.205E+02	.205E+02	.205E+02	.205E+02

MEAN MOL WT

PAGE 3

Y = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440029, F10 = 100.00 F100 = 100.00 G1 = 0.00
 LATITUDE = 185.0

LONG. (-WEST) (+EAST)	(-SOUTH) LATITUDES (+NORTH)				
	50.	60.	70.	80.	90.
10.	.205E+02	.205E+02	.205E+02	.204E+02	.203E+02
20.	.205E+02	.205E+02	.205E+02	.204E+02	.203E+02
30.	.205E+02	.205E+02	.205E+02	.204E+02	.203E+02
40.	.205E+02	.205E+02	.205E+02	.204E+02	.203E+02
50.	.205E+02	.205E+02	.205E+02	.204E+02	.203E+02
60.	.205E+02	.205E+02	.204E+02	.204E+02	.203E+02
70.	.205E+02	.205E+02	.204E+02	.204E+02	.203E+02
80.	.204E+02	.204E+02	.204E+02	.204E+02	.203E+02
90.	.204E+02	.204E+02	.204E+02	.204E+02	.203E+02
100.	.204E+02	.204E+02	.204E+02	.204E+02	.203E+02
110.	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02
120.	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02
130.	.202E+02	.203E+02	.203E+02	.203E+02	.203E+02
140.	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02
150.	.201E+02	.202E+02	.203E+02	.203E+02	.203E+02
160.	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
170.	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
180.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
190.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
200.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
210.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
220.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
230.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
240.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
250.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
260.	.201E+02	.201E+02	.202E+02	.203E+02	.203E+02
270.	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
280.	.201E+02	.202E+02	.202E+02	.203E+02	.203E+02
290.	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02
300.	.202E+02	.202E+02	.203E+02	.203E+02	.203E+02
310.	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02
320.	.203E+02	.203E+02	.203E+02	.203E+02	.203E+02
330.	.204E+02	.204E+02	.204E+02	.204E+02	.203E+02
340.	.204E+02	.204E+02	.204E+02	.204E+02	.203E+02
350.	.205E+02	.204E+02	.204E+02	.204E+02	.203E+02
360.	.205E+02	.205E+02	.204E+02	.204E+02	.203E+02

	(-SOUTH) LATITUDES (+NORTH)						
	-90.	-80.	-70.	-60.	-50.	-40.	-30.
ON.							
WEST)							
EAST)							

[illegible]

PAGE 2

[illegible]

LOG DEN (GM/CM3)

PAGE 3

YR = 1968 DAY = 20 MONTH = 6 HOUR = 12 MIN = 0
 MJD = 2440028. F10 = 100.00 F10B = 100.00 CI = 0.00
 ALTITUDE = 165.0

	(-SOUTH) LATITUDES (+NORTH)				
LONG.	50.	60.	70.	80.	90.
(-WEST)					
(+EAST)					
10.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
20.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
30.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
40.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
50.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
60.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
70.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
80.	-.124E+02	-.124E+02	-.124E+02	-.125E+02	-.125E+02
90.	-.124E+02	-.124E+02	-.125E+02	-.125E+02	-.125E+02
100.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
110.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
120.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
130.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
140.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
150.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
160.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
170.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
180.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
190.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
200.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
210.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
220.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
230.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
240.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
250.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
260.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
270.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
280.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
290.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
300.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
310.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
320.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
330.	-.125E+02	-.125E+02	-.125E+02	-.125E+02	-.125E+02
340.	-.124E+02	-.124E+02	-.124E+02	-.125E+02	-.125E+02
350.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02
360.	-.124E+02	-.124E+02	-.124E+02	-.124E+02	-.125E+02

APPENDIX A

PROGRAM JAC70

```

2 REMARKDATA)
3 PROGRAM JAC70(3),ACI-491681 JACCHIN 70 MODEL (FEEDH SYSTEM)
4 C*****
5 C**
6 C** DESCRIPTION: PROGRAM 'JAC70' IS THE JACCHIN 70 MODEL **
7 C** WHICH WAS CONVERTED FROM THE UNIVAC 1108 **
8 C** TO THE FEEDH SYSTEM. **
9 C** **
10 C** INPUTS: USER PROVIDES INPUT PARAMETERS VIA 'CRT'. **
11 C** **
12 C** DATA BASE: DISC FILE 'JAC70' CONTAINS THE DATA BASE **
13 C** FOR 'JAC70'. **
14 C** **
15 C** OUTPUTS: A MATRIX GRID OUTPUT IS GENERATED TO THE **
16 C** HP-2608 PRINTER. **
17 C** **
18 C** WRITTEN BY: JOHN S. HICKEY (ACI) 533-7590 **
19 C** MIKE DICKERSON (ACI) 533-7590 **
20 C** **
21 C*****
22 C
23 C** COMMON STATEMENTS
24 C
25 COMMON /EDATA/ IYR, IDH,MN, IHP, MIN, XIND, F10, F10B, GI, ILAT, ILNG,
26 XLAT, XLNG
27 COMMON /XDATA/ AMAT(37,37), DENHAT(37,37), DENLOG(37,37), HEMAT(37,37),
28 HMAT(37,37), OZMAT(37,37), OMAT(37,37), TEMP(37,37),
29 XN2(37,37), WTMAT(37,37)
30 COMMON /ZDATA/ A(300,6), DENLG(300), DENSG(300), DL(300), EIR(300),
31 T2Z(300), XLATT(300), XLONG(300), Z(300)
32 C
33 C** DIMENSION STATEMENTS
34 C
35 DIMENSION KBUF(15)
36 DIMENSION IDCB(276), IBUF(40), NAME(3), IPAR(5)
37 C
38 C** DATA STATEMENTS
39 C
40 DATA NAME/2HJA,2HC7,2HOD/
41 C
42 C*****
43 C** FETCH 'CRT' LOGICAL UNIT NUMBER. **
44 C*****
45 C
46 CALL PHPAR(IPAR)
47 LU = IPAR(1)
48 C
49 C** PRINT OUT BANNER PAGE INCLUDING PROGRAM NAME AND DATE
50 C
51 CALL FTIME(KBUF)
52 WRITE(6,107)
53 107 FORMAT("I")
54 DO 7 K=1,10
55 WRITE(6,108) (KBUF(I),I=1,15)
56 108 FORMAT(" ***** PROGRAM JAC70 EXECUTED AT: ",15A2,

```

```
87      * NASA/MSFC REEDA SYSTEM *****
88 7      CONTINUE
89 C
90 C*****
91 C** ASK USER FOR 'INDEX VARIABLES'?? **
92 C** 11 -- GEOMAGNETIC INDEX **
93 C** 12 -- DIURNAL EQUATION INDEX **
94 C*****
95 C
96      WRITE(LU,100)
97 100 FORMAT("ENTER GEOMAGNETIC INDEX? (1-KP, 2-AP)? _")
98      READ(LU,*) I1
99      WRITE(LU,101)
100 101 FORMAT("ENTER DIURNAL EQU INDEX? (1-KP,2-F106,3-AVG)? _")
101      READ(LU,*) I2
102 C
103 C** ASK FOR JACCHIA DATA FILE?
104 C
105 665 WRITE(LU,666)
106 666 FORMAT("ENTER DATA FILE: _")
107      READ(LU,667) (NAME(K),K=1,3)
108 667 FORMAT(3A2)
109 C
110 C** OPEN 'JACXXX' DATA BASE DISC FILE
111 C
112      CALL OPEN(IDCB,IERR,NAME,0)
113      IF(IERR.LT.0) WRITE(LU,668)
114 668 FORMAT(" *** ERROR -- FILE NOT EXISTING *** ")
115      IF(IERR.LT.0) GO TO 665
116 C
117 C** PRINT HEADER AND TITLE INFORMATION
118 C
119      WRITE(6,109) (NAME(K),K=1,3),I1,I2
120 109 FORMAT("1",///," PROGRAM NAME: JAC70",/,
121          " -----",/,
122          " DATA FILE: ",3A2,/,
123          " -----",/,
124          " GEOMAG INDEX: ",I6,/,
125          " -----",/,
126          " DIURNAL INDEX: ",I6,/,
127          " -----",/)
128 C
129 C*****
130 C** READ 'INPUT1' DATA VALUES **
131 C*****
132 C
133 C** SKIP 'INPUT1' HEADER RECORD
134 C
135      CALL READF(IDCB,IERR,IBUF)
136 C
137 C** READ 'ILAT' & 'ILNG'
138 C
139      CALL READF(IDCB,IERR,IBUF)
140      CALL CODE
141      READ(IBUF,300) ILAT,ILNG
```

```
112 300 FORMAT(9X,13,10X,13)
113 C
114 C++ READ 'XLATT' ARRAY UP TO 'ILAT' POINTS
115 C
116 DO 1 I=1,5
117 J = (I-1)*10 + 1
118 CALL READF(IDCB,IERR,IBUF)
119 CALL CODE
120 READ(IBUF,301) (XLATT(K),K=J,J+9)
121 301 FORMAT(10X,10(F5.0,1X))
122 1 CONTINUE
123 C
124 C++ READ 'XLONG' ARRAY UP TO 'ILNG' POINTS
125 C
126 DO 2 I=1,5
127 J = (I-1)*10 + 1
128 CALL READF(IDCB,IERR,IBUF)
129 CALL CODE
130 READ(IBUF,301) (XLONG(K),K=J,J+9)
131 2 CONTINUE
132 C
133 C++ SKIP 'INPUT1' END RECORD
134 C
135 CALL READF(IDCB,IERR,IBUF)
136 C
137 C*****
138 C++ ASK USER FOR NUMBER OF CASES 'NCASE' **
139 C*****
140 C
141 WRITE(LU,102)
142 102 FORMAT("ENTER NCASE: ")
143 READ(LU,*) NCASE
144 C
145 C++ LOOP TO PROCESS 'NCASES'
146 C
147 DO 104 INC=1,NCASE
148 C*****
149 C++ READ 'INPUT2' DATA BASE VALUES. **
150 C*****
151 C
152 C
153 C++ SKIP 'INPUT2' START RECORD
154 C
155 CALL READF(IDCB,IERR,IBUF)
156 C
157 C++ READ IZ,Z,XMDJ,F10,F10B, & GI
158 C
159 CALL READF(IDCB,IERR,IBUF)
160 CALL CODE
161 READ(IBUF,302) IZ,Z(1),XMDJ,F10,F10B,GI
162 302 FORMAT(6X,13,3X,F6.1,6X,F6.1,5X,F6.1,6X,F6.1,4X,F6.1)
163 C
164 C++ READ IYR,MN,IDA,IHR, & MIN
165 C
166 CALL READF(IDCB,IERR,IBUF)
```

```
167      CALL CODE
168      READ(IBUF,303) IYR,MN,IDA,IHR,MIN
169      303 FORMAT(7X,14,4X,12,5X,12,5X,12,5X,12)
170 C
171 C++ READ ITEMP,IXN2,I02,I0,IA,IHE,IH,IEM
172 C
173      CALL READF(IDCB,IERR,IBUF)
174      CALL CODE
175      READ(IBUF,304) ITEMP,IXN2,I02,I0,IA,IHE,IH,IEM
176      304 FORMAT(9X,13,6X,13,5X,13,4X,13,4X,13,5X,13,4X,13,5X,13)
177 C
178 C++ READ IDEN & IDLOG
179 C
180      CALL READF(IDCB,IERR,IBUF)
181      CALL CODE
182      READ(IBUF,305) IDEN,IDLOG
183      305 FORMAT(8X,13,7X,13)
184 C
185 C++ INITIALIZE XMJD = 0.0 & I2 = 1
186 C
187      XMJD = 0.0
188      I2 = 1
189 C
190 C++ INITIALIZE J COUNTER = 0
191 C
192      J=0
193 C
194 C++ LOOP TO PROCESS 'XLAT' DATA
195 C
196      DO 202 I1=1,ILAT
197 C
198 C++ LOOP TO PROCESS 'XLONG' DATA
199 C
200      DO 201 I1=1,ILNG
201      XLAT=XLATT(I1)
202      XLNG=XLONG(I1)
203 C
204 C++ LATITUDE -- LT, LONGITUDE -- LD
205 C
206      DO 200 I=1,I2
207      J=J+1
208 C
209 C++ CHECK J COUNTER EXCEEDS 30 ?
210 C
211      IF(J-30)52,52,51
212 C
213 C++ RESET J COUNTER = 0
214 C
215 51      CONTINUE
216      J=0
217 C
218 C++ CALL 'TME' SUBROUTINE
219 C
220      52 CONTINUE
221      CALL TME(MN,IDA,IYR,IHR,MIN,XMJD,XLAT,XLNG,SDA,SHA,DD,DY)
```

```
222 C
223 C** CALL 'TINF' SUBROUTINE
224 C
225 C*****
226 C** SET RE=0.31**
227 C*****
228 RE = 0.31
229 CALL TINF(F10,F10B,G1,XLAT,SDA,SHA,DY,RE,I1,I2,TE)
230 T=TE
231 C
232 C** CALL 'JAC' SUBROUTINE
233 C
234 CALL JAC(Z(I),T,TZZ(I),A(I,1),A(I,2),A(I,3),A(I,4),A(I,5),A(I,6),
235 EM(I),DENS(I),DL(I))
236 C
237 C** INITIALIZE VARIABLES
238 C
239 ZZ=Z(I)
240 DUMMY=0.
241 DEN=0.
242 DENLG(I)=0.
243 DUMMY=DL(I)
244 DEN=DL(I)
245 YDAY=DD
246 IF(ZZ-170.)20,20,50
247 C
248 C** CALL 'SLV' SUBROUTINE
249 C
250 20 CALL SLV(DUMMY,ZZ,XLAT,YDAY)
251 DENLG(I)=DUMMY
252 GO TO 40
253 50 IF(ZZ-500.)40,40,30
254 C
255 C** CALL 'SLVH' SUBROUTINE
256 C
257 30 CALL SLVH(DEN,A(I,5),XLAT,SDA)
258 DL(I)=DEN
259 40 CONTINUE
260 DL(I)=DL(I)+DENLG(I)
261 DENS(I) = 10.*DL(I)
262 XLAT=XLAT+(57.29577951)
263 C
264 C** COMPUTE DENMAT(I1,I11)
265 C
266 DENMAT(I1,I11) = DENS(I) * 1000.
267 TEMP(I1,I11) = TZZ(I)
268 XN2(I1,I11) = A(I,1)
269 G2MAT(I1,I11) = A(I,2)
270 OMAT(I1,I11) = A(I,3)
271 ANAT(I1,I11) = A(I,4)
272 HENAT(I1,I11) = A(I,5)
273 HMAT(I1,I11) = A(I,6)
274 WTMAT(I1,I11) = EM(I)
275 DENLOG(I1,I11) = DL(I)
276 200 CONTINUE
```



```
277 201 CONTINUE
278 202 CONTINUE
279 C
280 C** PERFORM MATRIX PRINTOUT
281 C
282 IF(IDEN.NE.0) CALL MATPR(1)
283 IF(ITEMP.NE.0) CALL MATPR(2)
284 IF(IYN2.NE.0) CALL MATPR(3)
285 IF(I02.NE.0) CALL MATPR(4)
286 IF(I0.NE.0) CALL MATPR(5)
287 IF(IA.NE.0) CALL MATPR(6)
288 IF(IHE.NE.0) CALL MATPR(7)
289 IF(IH.NE.0) CALL MATPR(8)
290 IF(IEN.NE.0) CALL MATPR(9)
291 IF(IDLOG.NE.0) CALL MATPR(10)
292 104 CONTINUE
293 C
294 C** PROGRAM 'JAC70' COMPLETED
295 C
296 999 STOP
297 END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 1780

COMMON: (NONE)

```

298 #EMACXDATA)
299 SUBROUTINE MATPR(IP)
300 C*****
301 C** SUBROUTINE 'MATPR' PERFORMS THE PRINTOUT OF **
302 C** THE SPECIFIED MATRIX. **
303 C*****
304 C
305 C** COMMON STATEMENTS
306 C
307 COMMON /EDATA/ IYR,IDA,MN,IHP,MIN,XMJD,F10,F10B,G1,ILAT,ILNG,
308 XLAT,XLNG
309 COMMON/XDATA/AMAT(37,37),DENMAT(37,37),DENLOG(37,37),HEMAT(37,37),
310 HMAT(37,37),OZMAT(37,37),OMAT(37,37),TEMP(37,37),
311 XN2(37,37),UTMAT(37,37)
312 COMMON /FDATA/ A(300,6),DENLG(300),DENS(300),DL(300),EM(300),
313 TZZ(300),XLATT(300),XLONG(300),Z(300)
314 C
315 C** DIMENSION STATEMENTS
316 C
317 DIMENSION IHEAD(9,10)
318 C
319 C** DATA STATEMENTS
320 C
321 DATA IHEAD/2HDE,2HNS,2HIT,2HIE,2HS,2HKK,2HGG,2HMM,2H,
322 2HTE,2HMP,2H,2HDE,2HGG,2H K,2H,2H,2H,
323 2H(N,2H2),2H,2H,2H,2H,2H,2H,2H,2H,
324 2H(O,2H2),2H,2H,2H,2H,2H,2H,2H,2H,
325 2H(O,2H),2H,2H,2H,2H,2H,2H,2H,2H,
326 2H(A,2H),2H,2H,2H,2H,2H,2H,2H,2H,
327 2H(H,2HE),2H,2H,2H,2H,2H,2H,2H,2H,
328 2H(H,2H),2H,2H,2H,2H,2H,2H,2H,2H,
329 2HME,2HAN,2H M,2HOL,2H W,2HT,2H,2H,2H,
330 2HLO,2HG,2HDE,2HN,2H(G,2HM,2HCM,2H3),2H /
331 C
332 C** COMPUTE NPG
333 C
334 NPG = ILAT / 7
335 C
336 C** LOOP FOR NPG TIMES
337 C
338 IF(MOD(ILAT,7) .NE. 0) NPG = NPG + 1
339 DO 300 II=1,NPG
340 ISTR = (II - 1) * 7 + 1
341 ISTR = ISTR + 6
342 IF(ISTR .GT. ILAT) ISTR = ILAT
343 C
344 C**WRITE HEADER
345 C
346 WRITE(6,7000) (IHEAD(I,IP),I=1,9),II,IYR,IDA,MN,IHP,MIN,XMJD,F10,
347 F10B,G1,Z(1)
348 7000 FORMAT(1H1,29X,9A2,51X,"PAGE ",I2,/,
349 11X,"YR = ",I4,3X,"DAY = ",I2,3X,"MONTH = ",I2,3X,"HOUR = ",I2,3X,
350 2"MIN = ",I2/1X,"XJD = ",F9.0,3X,"F10 = ",F6.2,3X,
351 3"F10B = ",F6.2,3X,"G1 = ",F6.2/1X,"ALTITUDE = ",F7.1)
352 C

```

```
353 C** PRINTOUT 'XLATT' ARRAY
354 C
355     WRITE(6,7001) (XLATT(I),I=ISTR,ISTP)
356 7001 FORMAT(1H0,30X,"(- SOUTH) LATITUDES (+NORTH)"/1X,"LON.",0X,
357     17(F5.0,5X))
358     WRITE(6,7003)
359 7003 FORMAT(1H , "(-WEST)"/1X,"(+EAST)"/)
360 C
361 C** PRINTOUT 'XLONG' ARRAY
362 C
363     DO 250 J=1,ILNG
364     IF(IP.EQ.1) WRITE(6,7002) XLONG(J),(DENMAT(J,I),I=ISTR,ISTP)
365     IF(IP.EQ.2) WRITE(6,7002) XLONG(J),( TEMP(J,I),I=ISTR,ISTP)
366     IF(IP.EQ.3) WRITE(6,7002) XLONG(J),( XN2(J,I),I=ISTR,ISTP)
367     IF(IP.EQ.4) WRITE(6,7002) XLONG(J),( O2MAT(J,I),I=ISTR,ISTP)
368     IF(IP.EQ.5) WRITE(6,7002) XLONG(J),( OMAT(J,I),I=ISTR,ISTP)
369     IF(IP.EQ.6) WRITE(6,7002) XLONG(J),( AMAT(J,I),I=ISTR,ISTP)
370     IF(IP.EQ.7) WRITE(6,7002) XLONG(J),( HEMAT(J,I),I=ISTR,ISTP)
371     IF(IP.EQ.8) WRITE(6,7002) XLONG(J),( HHAT(J,I),I=ISTR,ISTP)
372     IF(IP.EQ.9) WRITE(6,7002) XLONG(J),( WTMAT(J,I),I=ISTR,ISTP)
373     IF(IP.EQ.10) WRITE(6,7002) XLONG(J),(DENLOG(J,I),I=ISTR,ISTP)
374 7002 FORMAT(1H ,F4.0,4X,7E10.3)
375 250 CONTINUE
376 300 CONTINUE
377 C
378 C** RETURN TO CALLING PROGRAM
379 C
380     RETURN
381     END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 866 COMMON: (NONE)

```

382      SUBROUTINE TINF(F10,F10B,GI,XLAT,SDA,SHA,DY,RE,I1,I2,TE)
383 C*****
384 C** SUBROUTINE 'TINF' CALCULATES THE EXOSPHERIC TEMPERATURE **
385 C** ACCORDING TO JACCHIA SMO NO. 313, 1970. **
386 C** **
387 C** F10 = SOLAR RADIO NOISE FLUX (XE-22 WATTS/M**2) **
388 C** F10B= 61-DAY AVERAGE F10 **
389 C** GI = GEOMAGNETIC ACTIVITY INDEX **
390 C** LAT = GEOGRAPHIC LATITUDE AT PERIGEE (IN RAD) **
391 C** SDA = SOLAR DECLINATION ANGLE (IN RAD) **
392 C** SHA = SOLAR HOUR ANGLE **
393 C** DY = D/Y (DAY NUMBER/TROPICAL YEAR); 1 **
394 C** I1 = GEOMAGNETIC EQUATION INDEX(1--GI=KP, 2--GI=AP, **
395 C** I2 = DIURNAL EQU INDEX (1--R(KP),2--R(F10B),3--R(AVG), **
396 C** RE = DIURNAL FACTOR KP,F10B,AVG. **
397 C** **
398 C** CONSTANTS -- C=SOLAR ACTIVITY VARIATION. **
399 C** -- BETA,ETC. = DIURNAL VARIATION. **
400 C** -- D=GEOMAGNETIC VARIATION. **
401 C** -- E=SIMIANNUAL VARIATION. **
402 C** **
403 C*****
404 C
405 C** DATA STATEMENTS
406 C
407      DATA C1/383.0/
408      DATA C2/3.32/
409      DATA C3/1.80/
410      DATA P1/3.14159/
411 C
412 C** PERFORM CALCULATIONS
413 C
414      CON = P1/180.
415      BETA= -37.0*CON
416      GAMMA= 43.0*CON
417      P = 6.0*CON
418      XM = 2.5
419      XNN = 3.0
420 C
421 C** INITIALIZE GEOMAGNETIC VARIATION VARIABLES
422 C
423      D1 = 28.0
424      D2 = 0.03
425      D3 = 1.0
426      D4 = 100.0
427      D5 = -0.08
428 C
429 C** INITIALIZE SIMIANNUAL VARIATION VARIABLES
430 C
431      E1 = 2.41
432      E2 = 0.349
433      E3 = 0.206
434      E4 = 360.*CON
435      E5 = 226.5*CON
436      E6 = 720.*CON

```

```
437      E7 = 247.6*CON
438      E8 = 0.1145
439      E9 = 0.5
440      E10 = E4
441      E11 = 342.3*CON
442      E12 = 2.16
443 C
444 C** SOLAR ACTIVITY VARIATION
445 C
446      TC = C1 + C2*F10B + C3*(F10 - F10B)
447 C
448 C** DIURNAL VARIATION
449 C
450      ETA = 0.5*ABS(XLAT - SDA)
451      THETA = 0.5*ABS(XLAT + SDA)
452      TAU = SHA + BETA + P*SIN(SHA + GAMMA)
453      TPI = 2*PI
454      IF(TAU) 210,230,230
455      210 IF(TAU+PI) 220,250,250
456      220 TAU = TAU + TPI
457      GO TO 210
458      230 IF(TAU-PI) 250,250,240
459      240 TAU = TAU - TPI
460      GO TO 230
461      250 CONTINUE
462 C
463 C*****
464 C** SET R = RE (RE = 0.31) **
465 C*****
466 C
467      RE = 0.31
468      R = RE
469      A1 = (SIN(THETA))*XM
470      A2 = (COS(ETA))*XM
471      A3 = (COS(TAU/2.))*XNH
472      B1 = 1.0 + R*A1
473      B2 = (A2-A1)/(1. + R*A1)
474      TV = B1*(1. + R*B2*A3)
475      TL = TC + TV
476 C
477 C** GEOMAGNETIC VARIATION
478 C
479      IF (I1-I) 50,50,60
480      50 TG = D1*GI + D2*EXP(GI)
481      GO TO 70
482      60 TG = D3*GI + D4*(1-EXP(D5*GI))
483      70 CONTINUE
484 C
485 C** SENIANNUAL VARIATION
486 C
487      G3 = 0.5*(1.0 + SIN(E10*DY + E11))
488      G3 = G3**E12
489      TAU1 = DY + E8*(G3 - E9)
490      G1 = E2 + E3*(SIN(E4*TAU1 + E5))
491      G2 = SIN(E6*TAU1 + E7)
```

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```
492      TS = EI + F10B*G1*G2
493 C
494 C** EXOSPHERIC TEMPERATURE
495 C
496      TE = TL + TG + TS
497 C
498 C** RETURN TO CALLING PROGRAM
499 C
500      RETURN
501      END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 568 COMMON: (NONE)

```

502      SUBROUTINE TME(MN,IDA,IYR,IHR,MIN,XMJD,XLAT,XLNG,SDA,SHA,DD,DY)
503 C*****
504 C** SUBROUTINE 'TME' PERFORMS THE CALCULATIONS OF THE SOLAR DECLI- **
505 C** NATION ANGLE AND SOLAR HOUR ANGLE. **
506 C** **
507 C** INPUTS: MN = MONTH **
508 C** IDA = DAY **
509 C** IYR = YEAR **
510 C** IHR = HOUR **
511 C** MIN = MINUTE **
512 C** XMJD= MEAN JULIAN DATE (IF=0 THEN XMJD IS CALCULATED) **
513 C** XLAT= LATITUDE (INPUT-GEOCENTRIC LATITUDE) **
514 C** XLNG= LONGITUDE(INPUT-GEOCENTRIC LONGITUDE,-180,+180) **
515 C** **
516 C** OUTPUTS: SDA = SOLAR DECLINATION ANGLE (RAD) **
517 C** SHA = SOLAR HOUR ANGLE (RAD) **
518 C** DD = DAY NUMBER FROM 1 JAN. **
519 C** DY = DD/TROPICAL YEAR **
520 C*****
521 C
522 C** DIMENSION STATEMENTS
523 C
524      DIMENSION IDAY(12)
525 C
526 C** DATA STATEMENTS
527 C
528      DATA IDAY/31,28,31,30,31,30,31,31,30,31,30,31/
529      DATA YEAR/365.2422/
530 C
531 C** SET CONSTANTS
532 C
533      XLAT=XLAT/57.29577951
534      YR=IYR
535      J=IYR-4*(IYR/4)
536      IF(J)10,5,10
537      5 IDAY(2)=29
538      10 CONTINUE
539      IF (MN-1) 3,3,4
540      3 DD=IDA
541      GO TO 6
542      4 KE=MN-1
543      ID=0
544      DO 20 I=1,KE
545      ID = ID + IDAY(I)
546      20 CONTINUE
547      ID = ID + IDA
548      DD = ID
549      6 DY = DD/YEAR
550 C
551 C** COMPUTE MEAN JULIAN DATE IF XMJD = 0
552 C
553      IF(XMJD) 30,25,30
554      25 XMJD = 2439956. + 365.*(YR-1968.) + DD
555      LDD = (IYR-1965)/4
556      XMJD = XMJD + LDD

```

```

557 30 FMJD = XMJD - 2435939.
558 C
559 C++ COMPUTE GREENWICH MEAN TIME IN MINUTES GMT
560 C
561 XHR = IHR
562 XMIN = MIN
563 GMT = 60*XHR + XMIN
564 C
565 C++ COMPUTE GREENWICH MEAN POSITION - GP (IN DEG)
566 C
567 XJ = (XMJD - 2415020.0)/(36525.0)
568 A1 = 99.6909833
569 A2 = 36000.76854
570 A3 = 0.00038708
571 A4 = 0.25068447
572 GP = A1 + A2*XJ + A3*XJ*XJ + A4*GMT
573 N = GP/360.
574 XN = N
575 GP = GP - XN*360.
576 C
577 C++ COMPUTE RIGHT ASCENSION POINT - RAP (IN DEG)
578 C
579 C++ 1ST CONVERT GEOCENTRIC LONGITUDE TO DEG LONGITUDE - WEST NEG + EAST
580 C
581 IFACT = XLNG/180.
582 XFACT = IFACT
583 XLNG = XLNG - 360.*XFACT
584 C
585 RAP = GP + XLNG
586 N = RAP/360.
587 XN = N
588 RAP = RAP - XN*360.
589 C
590 C++ COMPUTE CELESTIAL LONGITUDE - XLS (IN RAD) - -ZERO TO 2PI
591 C
592 B1 = 0.017203
593 B2 = 0.0335
594 B3 = 1.410
595 Y1 = B1 + FMJD
596 XLS = Y1 + B2*SIN(Y1) - B3
597 TPI = 6.28318
598 N = XLS/TPI
599 XN = N
600 XLS = XLS - XN*TPI
601 C
602 C++ COMPUTE SOLAR DECLINATION ANGLE - SDA (IN RAD)
603 C
604 B4 = (TPI/360.)*23.45
605 SDA = ASIN(SIN(XLS)*SIN(B4))
606 C
607 C++ COMPUTE RIGHT ASCENSION OF SUN - RAS (IN RAD) - -ZERO TO 2PI
608 C
609 RAS = ASIN(TAN(SDA)/TAN(B4))
610 C
611 C++ PUT RAS IN SAME QUADRANT AS XLS

```



```
612 C
613     PI = 3.14159
614     PI2 = PI/2.
615     PI32= 3.*PI2
616     RAS = ABS(RAS)
617     TEMP = ABS(XL5)
618     IF(TEMP - PI2) 130,130,100
619 100 IF(TEMP - PI) 105,105,110
620 105 RAS = PI - RAS
621     GO TO 130
622 110 IF(TEMP - PI32) 115,115,120
623 115 RAS = PI + RAS
624     GO TO 130
625 120 RAS = TPI - RAS
626 130 IF (XL6) 135,140,140
627 135 RAS = -RAS
628 140 CONTINUE
629 C
630 C++ COMPUTE SOLAR HOUR ANGLE - SHA (IN DEG) - -
631 C
632     SHA = RAP*(PI/180.) - RAS
633     IF(SHA) 210,230,230
634 210 IF(SHA+PI) 220,250,250
635 220 SHA=SHA+TPI
636     GO TO 210
637 230 IF(SHA-PI) 250,250,240
638 240 SHA=SHA-TPI
639     GO TO 230
640 250 CONTINUE
641 C
642 C++ RETURN TO CALLING PROGRAM
643 C
644     RETURN
645     END
```

FTN4X COMPILER: HP92634 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 580 COMMON: (NONE)

```
646      SUBROUTINE JAC(Z,T,TZ,AN,A02,A0,AA,AHE,AM,EM,DENS,DL)
647 C*****
648 C++ SUBROUTINE 'JAC' PERFORMS THE SIMPSONS RULE QUADRA- **
649 C++ TURE (8RQ4) IMPLEMENTED BY G. F. KUNCIR. **
650 C++ **
651 C++ A = LOWER LIMIT OF INTEGRATION **
652 C++ D = UPPER LIMIT OF INTEGRATION **
653 C++ FUNC = INTEGRAND FUNCTION SUBPROGRAM **
654 C++ EPS = RELATIVE ERROR CONVERGENCE CRITERION **
655 C++ N = MAXIMUM NUMBER OF INTEGRATIONS **
656 C++ R = RESULT OF INTEGRATION **
657 C++ M = NUMBER OF INTEGRATIONS REQUIRED TO FIND R **
658 C++ **
659 C*****
660 C
661 C++ DIMENSION STATEMENTS
662 C
663      DIMENSION ALPHA(6),EI(6),DI(6),B(7),DIT(6)
664 C
665 C++ DATA STATEMENTS
666 C
667      DATA Q0/100./
668      DATA ALPHA/0.0,0.0,0.0,0.0,-.380,0.0/
669      DATA AV/6.02257E23/
670      DATA EI/28.0134,31.9988,15.9994,39.948,4.0026,1.00797/
671      DATA B/28.15204,-0.085586,1.2840E-04,-1.0056E-05,-1.0210E-05,
672      1.5044E-06,9.9826E-08/
673      DATA QN/.78110/
674      DATA Q02/.20955/
675      DATA QA/.009343/
676      DATA QHE/1.259E-05/
677      DATA FK/8.31432/
678 C++
679 C++ SET VARIABLES
680 C++
681      ALPHA(1) = 0.0
682      ALPHA(2) = 0.0
683      ALPHA(3) = 0.0
684      ALPHA(4) = 0.0
685      ALPHA(5) = -.38
686      ALPHA(6) = 0.0
687      AV = 6.02257E23
688      EI(1) = 28.0134
689      EI(2) = 31.9988
690      EI(3) = 15.9994
691      EI(4) = 39.948
692      EI(5) = 4.0026
693      EI(6) = 1.00797
694      B(1) = 28.15204
695      B(2) = -0.085586
696      B(3) = 1.2840E-04
697      B(4) = -1.0056E-05
698      B(5) = -1.0210E-05
699      B(6) = 1.5044E-06
700      B(7) = 9.9826E-08
```

```

701      QN = .78110
702      Q02 = .20955
703      QA = .009343
704      QNE = 1.269E-05
705      FK = 0.31432
706 C
707 C** PERFORM CALCULATIONS
708 C
709      T1 = T
710      TX=444.3607+.02365*T1-392.8292*EXP(-.0021357*T1)
711      A2=2.*(T-TX)/3.14159265
712      D1T(6)=0.
713      N=10
714      EPS=.0001
715      T1=1.9*(TX-183.)/35.
716      T4=3.*(TX-183.-2.*T1*35./3.)/(35.**4)
717      T3=-T1/(3.*35.**2)+4.*T4*35./3.
718      T2=TX+T1*(2-125.)*T3*(2-125.)*+3*T4*(2-125.)*+4
719      IF (2-105.) 43,43,40
720      43 22 = 2 - Q0
721      EM=B(1)*B(2)*22*B(3)*22**2*B(4)*22**3*B(5)*22**4*B(6)*22**5
722      1+B(7)*22**6
723      D=2
724 70  CONTINUE
725      A=90.
726      FA=B(1)*B(2)*(A-Q0)*B(3)*(A-Q0)**2*B(4)*(A-Q0)**3*B(5)*(A-Q0)**4
727      1+B(6)*(A-Q0)**5 +B(7)*(A-Q0)**6
728      FA=FA*9.80665/((1.+A/6.356766E+3)**2)
729      FA=FA/(TX+T1*(A-125.)*T3*(A-125.)*+3 +T4*(A-125.)*+4)
730      FD=B(1)*B(2)*(D-Q0)*B(3)*(D-Q0)**2*B(4)*(D-Q0)**3+B(5)*(D-Q0)**4
731      1+B(6)*(D-Q0)**5 +B(7)*(D-Q0)**6
732      FD=FD*9.80665/((1.+D/6.356766E+3)**2)
733      FD=FD/(TX+T1*(D-125.)*T3*(D-125.)*+3 +T4*(D-125.)*+4)
734 C
735 C** INITIALIZE COUNTERS
736 C
737      N=0
738      PREV=0.
739      SONE=(D-A)*(FA+FD)/2.
740 71  N=N+1
741      IF (N-N) 72,72,75
742 72  NINT=2**N
743      STWO=0.
744      DEL=(D-A)/FLOAT(NINT)
745      DO 73 I=1,NINT,2
746      X=A+DEL*FLOAT(I)
747      FX=B(1)*B(2)*(X-Q0)*B(3)*(X-Q0)**2+B(4)*(X-Q0)**3+B(5)*(X-Q0)**4
748      1+B(6)*(X-Q0)**5 +B(7)*(X-Q0)**6
749      FX=FX*9.80665/((1.+X/6.356766E+3)**2)
750      FX=FX/(TX+T1*(X-125.)*T3*(X-125.)*+3 +T4*(X-125.)*+4)
751 73  STWO=STWO+FX
752      CUR=SONE+4.*DEL*STWO
753      IF (EPS*ABS(CUR)-ABS(CUR-PREV)) 74,75,75
754 74  PREV=CUR
755      SONE=(SONE+CUR)/4.

```

```

754      GO TO 71
757 75    R=CUR/3
758      IF (Z-105.) 44,76,44
759      44 IF (U-105.) 76,55,76
760 76    DENS=3.46E-9*183.*EM*EXP(-R/FK)/(TZ+28.878)
761      DL=ALOGT(DENS)
762      PAR=AV*DENS/EM
763      AN=ALOGT(QN*EM*PAR/28.96)
764      AA=ALOGT(QA*EM*PAR/28.96)
765      AHE=ALOGT(QHE*EM*PAR/28.96)
766      AO=ALOGT(2.*PAR*(1.-EM/28.96))
767      A02=ALOGT(PAR*(EM*(1.+002)/28.96-1.))
768      AH=-0.
769 C
770 C++ RETURN TO CALLING PROGRAM
771 C
772      RETURN
773 C
774 C++ CONTINUE CALCULATIONS
775 C
776      40 Z3=105.
777      TZ3=TX+T1*(Z3-125.)+T3*(Z3-125.)**3+T4*(Z3-125.)**4
778      ZM3=B(1)*B(2)* 5.+B(3)* 25.+B(4)* 125.+B(5)* 5.**4.+B(6)* 5.**5.
779      1*B(7)* 5.**6.
780      D=105.
781      GO TO 70
782 55    DEN1=3.46E-9*183.*ZM3*EXP(-R/FK)/(TZ3+28.878)
783      PAR=AV*DEN1/ZM3
784      DI(1)=QN*ZM3*PAR/28.96
785      DI(2)=PAR*(ZM3*(1.+002)/28.96-1.)
786      DI(3)=2.*PAR*(1.-ZM3/28.96)
787      DI(4)=QA*ZM3*PAR/28.96
788      DI(5)=QHE*ZM3*PAR/28.96
789      IF(Z-125.) 56,56,90
790 56    CONTINUE
791      A1=105.
792      FA1=9.80665/((1.+A1/6.356766E+3)**2)
793      FA1=FA1/(TX+T1*(A1-125.)+T3*(A1-125.)**3+T4*(A1-125.)**4)
794      D1=2
795      FD1=9.80665/((1.+D1/6.356766E+3)**2)
796      IF(D1-125.) 45,45,50
797 45    FD1=FD1/(TX+T1*(D1-125.)+T3*(D1-125.)**3+T4*(D1-125.)**4)
798      GO TO 51
799 50    FD1=FD1/(TX+A2*ATAN(T1*(D1-125.)*(1.+4.5E-6*(D1-125.)**2.5)/A2))
800      TZ=TX+A2*ATAN(T1*(Z-125.)*(1.+4.5E-6*(Z-125.)**2.5)/A2)
801 51    N=0
802      PREV=0
803      SONE=(D1-A1)*(FA1+FD1)/2.
804 61    N=N+1
805      IF (N-N) 82,82,85
806 82    NINT=2**N
807      STUO=0.
808      DEL=(D1-A1)/FLOAT(NINT)
809      DO 83 I=1,NINT,2
810      XI=A1+DEL*FLOAT(I)

```

```

011      FXI=9.80665/((1.+XI/6.356766E+3)**2)
012      IF(XI-125.) 46,46,52
013      46 FXI=FXI/(TX+T1*(XI-125.)*T3*(XI-125.)*+3+T4*(XI-125.)*+4)
014      GO TO 03
015 52    FXI=FXI/(TX+A2*ATAN(T1*(XI-125.)*(1.+4.5E-6*(XI-125.)*+2.5)/A2))
016 03    STWO=STWO+FXI
017      CUR=SONE+4.*DEL*STWO
018      IF (EPS+ABS(CUR)-ABS(CUR-PREV)) 04,05,05
019 04    FREV=CUR
020      SONE=(SONE+CUR)/4.
021      GO TO 01
022 05    R=CUR/3.
023      DO 41 I=1,5
024      DIT(I)=DIT(I)*(TZ3/TZ)**(1.+ALPHA(I))*EXP(-E1(I)*R/FK)
025      41 CONTINUE
026      DENS=0
027      DO 42 I=1,6
028      DENS=DENS+ DIT(I)*DIT(I)/AV
029 42    CONTINUE
030      EM=DENS*AV/(DIT(1)+DIT(2)+DIT(3)+DIT(4)+DIT(5)+DIT(6))
031      DL=ALOGT(DENS)
032      AN =ALOGT(DIT(1))
033      A02=ALOGT(DIT(2))
034      A0 =ALOGT(DIT(3))
035      AA =ALOGT(DIT(4))
036      AHE=ALOGT(DIT(5))
037      IF(2-500.) 47,48,48
038      47 DIT(6)=10.**(-6)
039      48 AH=ALOGT(DIT(6))
040      AN =AMAX1(-0., AN)
041      A02=AMAX1(-0., A02)
042      A0 =AMAX1(-0., A0)
043      AA =AMAX1(-0., AA)
044      AHE=AMAX1(-0., AHE)
045      AH =AMAX1(-0., AH)
046 C
047 C** RETURN TO CALLING PROGRAM
048 C
049      RETURN
050 C
051 C** CONTINUE CALCULATIONS
052 C
053 90      S=TX+A2*ATAN(T1+375.*(1.+4.5E-6*375.**2.5)/A2)
054      DI(6)=10.**((73.13-39.4*ALOGT(S)+5.5*ALOGT(S))*ALOGT(S))
055      A1=500.
056      IF(2-500.) 49,60,60
057      49 A1=2
058      60 FA1=9.80665/((1.+A1/6.356766E+3)**2)
059      FA1=FA1/(TX+A2*ATAN(T1*(A1-125.)*(1.+4.5E-6*(A1-125.)*+2.5)/A2))
060      D1=2
061      IF(2-500.) 61,62,62
062      61 D1=500.
063      62 FD1=9.80665/((1.+D1/6.356766E+3)**2)
064      FD1=FD1/(TX+A2*ATAN(T1*(D1-125.)*(1.+4.5E-6*(D1-125.)*+2.5)/A2))
065      H=0

```

```

866      PREV=0
867      SONE=(D1-A1)*(FA1+FD1)/2.
868 91    N=N+1
869      IF (N-M) 92,92,95
870 92    NINT=2+*N
871      STWO=0.
872      DEL=(D1-A1)/FLOAT(NINT)
873      DO 93 I=1,NINT,2
874      X1=A1+DEL*FLOAT(I)
875      FX1=9.80665/((1.+X1/6.356766E+3)**2)
876      FX1=FX1/(TX+A2+ATAN(T1*(X1-125.)*(1.+4.5E-6*(X1-125.)**2.5)/A2))
877 93    STWO=STWO+FX1
878      CUR=SONE+4.*DEL*STWO
879      IF (EPS+ABS(CUR)-ABS(CUR-PREV)) 94,95,95
880 94    PREV=CUR
881      SONE=(SONE+CUR)/4.
882      GO TO 91
883 95    R=CUR/3.
884      TZ=TX+A2+ATAN(T1*(Z-125.)*(1.+4.5E-6*(Z-125.)**2.5)/A2)
885      IF(Z-500.) 63,64,64
886 63    R=-R
887 64    DIT(6)=DI(6)*(S/TZ)*EXP(-E1(6)*R/FK)
888 C
889 C++ LOOP BACK FOR ADDITIONAL CALCULATIONS
890 C
891      GO TO 56
892 C
893 C++ RETURN TO CALLING PROGRAM
894 C
895 999    RETURN
896      END

```

FTN4X COMPILER: HP92634 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 2624 COMMON: (NONE)

```
897      SUBROUTINE SLV(DEN,ALT,XLAT,DAY)
898 C*****
899 C** SUBROUTINE 'SLV' COMPUTES THE SEASONAL-LATITUDINAL **
900 C** VARIATION OF DENSITY IN THE LOWER THERMOSPHERE (IN **
901 C** ACCORDANCE TO L. JACCHIA IN SAO 332, 1971. THIS AF- **
902 C** FECTS THE DENSITIES BETWEEN 90 AND 160KM. THIS SUB- **
903 C** ROUTINE NEED NOT BE CALLED FOR DENSITIES ABOVE 160KM, **
904 C** BECAUSE NO EFFECT IS OBSERVED. **
905 C** **
906 C** THE VARIATION SHOULD BE COMPUTED AFTER THE CALCULA- **
907 C** TION OF DENSITY DUE TO TEMPERATURE VARIATIONS AND THE **
908 C** DENSITY (DEN) MUST BE IN THE FORM OF A BASE 10 LOG. **
909 C** NO ADJUSTMENTS ARE MADE TO THE TEMPERATURE OR CONSTI- **
910 C** TUENT NUMBER DENSITIES IN THE REGION AFFECTED BY THIS **
911 C** VARIATION. **
912 C** **
913 C** DEN = DENSITY (LOG10) **
914 C** ALT = ALTITUDE (KM) **
915 C** XLAT = LATITUDE (RAD) **
916 C** DAY = DAY NUMBER **
917 C** **
918 C*****
919 C
920 C** INITIALIZE DENSITY (DEN) = 0.0
921 C
922      DEN = 0.0
923 C
924 C** CHECK IF ALTITUDE EXCEEDS 160KM?
925 C
926      IF (160 - ALT) 999,5,5
927 C
928 C** COMPUTE DENSITY CHANGE IN LOWER THERMOSPHERE
929 C
930      S Z = ALT - 90.
931      X = -0.0013*Z*Z
932      Y = 0.0172*DAY + 1.72
933      P = SIN(Y)
934      SP = SIN(XLAT)
935      SP = SP*SP
936      S = 0.014*Z*EXP(X)
937      D = S*P*SP
938 C
939 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'XLAT'
940 C
941      IF (XLAT) 10,15,15
942      10 D = -D
943      15 DEN = D
944 C
945 C** RETURN TO CALLING PROGRAM
946 C
947 999      RETURN
948      END
```

PAGE 21 SLV OPTS: LXI 2:04 PM MON., 21 SEP., 1981

FTN4X COMPILER: HP92834 REV.2030 (800821)

.. NO WARNINGS .. NO ERRORS .. PROGRAM: 123 COMMON: (NONE)


```

949      SUBROUTINE SLVM(DEN,DENHE,XLAT,SDA)
950 C*****
951 C** SUBROUTINE 'SLVM' COMPUTES THE SEASONAL-LATITUDINAL **
952 C** VARIATION OF THE HELIUM NUMBER DENSITY (ACCORDING **
953 C** TO L. JACCIA IN SAO 332, 1971). THIS CORRECTION **
954 C** IS NOT IMPORTANT BELOW ABOUT 300KM. **
955 C** **
956 C** DEN = DENSITY (LOG10) **
957 C** DENHE = HELIUM NUMBER DENSITY (LOG10) **
958 C** XLAT = LATITUDE (RAD) **
959 C** SDA = SOLAR DECLINATION ANGLE (RAD) **
960 C*****
961 C
962 C** PERFORM CALCULATIONS
963 C
964      D0 = 10.**DENHE
965      A = 0.65*(SDA*0.40909079)
966 C
967 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'A'
968 C
969      IF(A) 5,10,10
970      5 A = -A
971      10 B = 0.5*XLAT
972 C
973 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'B'
974 C
975      IF(SDA) 15,20,20
976      15 B = -B
977 C
978 C** COMPUTE X,Y,DHE, AND DENHE
979 C
980      20 X = 0.7854 - B
981      Y = SIN(X)
982      Y = Y*Y*Y
983      DHE= A*(Y - 0.35356)
984      DENHE = DENHE + DHE
985 C
986 C** COMPUTE HELIUM NUMBER DENSITY CHANGE
987 C
988      D1 = 10.**DENHE
989      DEL= D1 - D0
990      RHO= 10.**DEN
991      DRHO = (6.646E-24)*DEL
992      RHO = RHO + DRHO
993      DEN = ALOG10(RHO)
994 C
995 C** RETURN TO CALLING PROGRAM
996 C
997      RETURN
998      END

```

PAGE 23 SLVM OPTS: LXI

2:04 PM MON., 21 SEP., 1931

.. NO WARNINGS .. NO ERRORS .. PROGRAM: 149 COMMON: <NONE>

PAGE 24 FTH. OPTS: LXI 2:04 PM MON., 21 SEP., 1981

```

999      BLOCK DATA
1000 C*****
1001 C** THIS IS THE BLOCK DATA FOR THE **
1002 C** 'JAC70' PROGRAM. **
1003 C*****
1004 C
1005 C** COMMON BLOCK DATA
1006 C
1007      COMMON /EDATA/ IYR,IDA,MN,IHR,MIN,XMJD,F10,F10B,G1,ILAT,ILNG,
1008      .              XLAT,XLNG
1009      COMMON /FDATA/ AC(300,6),DENLC(300),DENS(300),DL(300),EM(300),
1010      .              TZZ(300),XLATT(300),XLONG(300),Z(300)
1011      END
```

FTH4X COMPILER: HP92834 REV. 2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: (NONE) COMMON: (NONE)

BLOCK COMMON FDATA SIZE: 8400

BLOCK COMMON EDATA SIZE: 19

JAC70 10042 13425 ACI-091661 JACCHIA '70 MODEL (REEDA SYSTEM)
 MATPR 13426 15167
 TINF 15170 16257
 TME 16260 17363
 JAC 17364 24463
 SLV 24464 24656
 SLVH 24657 25103
 FDATA 25104 45423
 EDATA 45424 45446

OPEN 45447 46011 92067-16125 REV.2001 791018
 CLOSE 46012 46225 92067-16125 REV.2001 791019
 READF 46226 47216 92067-16125 REV.2001 791015
 FTIME 47217 47510 92067-1X301 REV.2013 780731
 MOD 47511 47540 24998-1X107 REV.2001 751101
 \$SMVE 47541 47633 92067-1X483 REV.2013 800129
 RHPR 47634 47676 92068-1X025 REV.2013 781106
 OVRD. 47677 47677 92067-16125 REV.1903 780526
 LURD 47700 50312 92067-1X270 REV.2013 791024
 REIO 50313 50437 92067-1X275 REV.2013 790316
 SESSN 50440 50455 92067-16125 REV.1903 780413
 IFTTY 50456 50543 92067-1X295 REV.2013 790118
 ERRO 50544 50633 24998-1X250 REV.2001 771122
 .ITOI 50634 50752 24998-1X055 REV.2013 791017
 \$ALRN 50753 51070 92067-1X271 REV.2013 770715
 ER0.E 51071 51071 24998-1X249 REV.2001 750701
 .ASIN 51072 51175 24998-1X373 REV.2026 800222
 .RTOI 51176 51310 24998-1X063 REV.2013 791230
 .EIO. 51311 52526 24998-1X329 REV.2026 800708
 FMTIO 52527 53756 24998-1X328 REV.2030 800818
 .OPN? 53757 54002 24998-1X325 REV.2030 800503
 .FPAU 54003 54106 24998-1X324 REV.2030 800731
 .EXIT 54107 54162 24998-1X320 REV.2030 800731
 .IOCL 54163 54264 92828-1X305 REV.2030 800731
 CODE 54265 54324 24998-1X335 REV.2026 800303
 .FNCV 54325 56567 24998-1X333 REV.2026 800709
 .IOER 56570 56703 24998-1X321 REV.2030 800731
 .UFMP 56704 56716 24998-1X296 REV.2030 800731
 .FIO. 56717 57173 24998-1X330 REV.2026 800708
 .FIOI 57174 57253 24998-1X322 REV.2030 800803
 .RTOR 57254 57346 24998-1X064 REV.2026 800509
 .MXM1 57347 57503 24998-1X110 REV.2026 800303
 P.PAS 57504 57532 92067-16125 REV.1903 740801
 R/W6 57533 57671 92067-16125 REV.1903 781214
 \$OPEN 57672 60046 92067-16125 REV.1903 790103
 RU#UB 60047 60414 92067-16125 REV.1903 781003
 RUND# 60415 60537 92067-16125 REV.1903 780801
 LUTRU 60540 606 6 92067-1X708 REV.2013 790223
 PNAME 60647 60714 92068-1X035 REV.2013 771121
 LOGLU 60715 60772 92067-1X297 REV.2013 790228
 LINEM 60773 61013 92067-1X477 REV.2013 790126
 PAU.E 61014 61014 24998-1X254 REV.2001 750701
 .IOCM 61015 61054 92828-1X327 REV.2030 800803

22 PAGES RELOCATED .49 PAGES RED'D 27 PAGES ENA 6 PAGES MSEG
 LINKS:BP PROGAM:LB LOADITE COMMON:NC
 /LOADR:JAC70 READY AT 2:08 PM MON., 21 SEPT, 1981
 /LOADR:#END

APPENDIX B

PROGRAM JAC71

```

2 *EMAX(XDATA)
3   PROGRAM JAC71(3),ACI-091681 JACCHIA '71 MODEL (REEDA SYSTEM)
4 C*****
5 C**
6 C** DESCRIPTION:  PROGRAM 'JAC71' IS THE JACCHIA '71 MODEL **
7 C**                WHICH WAS CONVERTED FROM THE UNIVAC 1108 **
8 C**                TO THE REEDA SYSTEM. **
9 C**
10 C** INPUTS:      USER PROVIDES INPUT PARAMETERS VIA 'CRT'. **
11 C**
12 C** DATA BASE:  DISC FILE 'JAC71D' CONTAINS THE DATA BASE **
13 C**                FOR 'JAC71'. **
14 C**
15 C** OUTPUTS:     A MATRIX GRID OUTPUT IS GENERATED TO THE **
16 C**                HP-2608 PRINTER. **
17 C**
18 C** WRITTEN BY:   JOHN S. HICKEY (ACI) 533-7590 **
19 C**                MIKE DICKERSON (ACI) 533-7590 **
20 C**
21 C*****
22 C
23 C** COMMON STATEMENTS
24 C
25   COMMON /EDATA/ IYR,IDA,MN,IHR,MIN,XHJD,F10,F10B,G1,ILAT,ILNG,
26   , XLAT,XLNG
27   COMMON/XDATA/ALAT(37,37),DENMAT(37,37),DENLOG(37,37),HEMAT(37,37),
28   , HMAI(37,37),O2MAT(37,37),OMAT(37,37),TEMP(37,37),
29   , XN2(37,37),WTHAT(37,37)
30   COMMON /FDATA/ A(300,6),DENLG(300),DENS(300),DL(300),EM(300),
31   , TZZ(300),XLATT(300),XLONG(300),Z(300),DRHO1(300),
32   , DRHO2(300),DRHO3(300)
33 C
34 C** DIMENSION STATEMENTS
35 C
36   DIMENSION KBUF(15)
37   DIMENSION IDCB(276),IBUF(40),NAME(3),IPAR(5)
38 C
39 C** DATA STATEMENTS
40 C
41   DATA NAME/2HJA,2HC7,2HID/
42 C
43 C*****
44 C** FETCH 'CRT' LOGICAL UNIT NUMBER. **
45 C*****
46 C
47   CALL RMPAR(IPAR)
48   LU = IPAR(1)
49 C
50 C** PRINT OUT BANNER PAGE INCLUDING PROGRAM NAME AND DATE
51 C
52   CALL FTIME(KBUF)
53   WRITE(6,107)
54 107  FORMAT("1")
55   DO 7 K=1,10
56   WRITE(6,108) (KBUF(I),I=1,15)

```

```
57 100  FORMAT(' ***** PROGRAM JAC71 EXECUTED AT: ',15A2,  
58      ' NASA/MSP/ REEDA SYSTEM *****')  
59 7    CONTINUE  
60 C  
61 C*****  
62 C** ASK USER FOR 'INDEX VARIABLES'?? **  
63 C** 11 -- GEOMAGNETIC INDEX **  
64 C*****  
65 C  
66      WRITE(LU,100)  
67 100  FORMAT('ENTER GEOMAGNETIC INDEX? (1-KP, 2-AP)? _')  
68      READ(LU,*) I1  
69 C  
70 C** ASK FOR JACCHIA DATA FILE?  
71 C  
72 665  WRITE(LU,666)  
73 666  FORMAT('ENTER DATA FILE: _')  
74      READ(LU,667) (NAME(K),K=1,3)  
75 667  FORMAT(3A2)  
76 C  
77 C** OPEN 'JACXX' DATA BASE DISC FILE  
78 C  
79      CALL OPEN(IDC8,IERR,NAME,0)  
80      IF(IERR.LT.0) WRITE(LU,668)  
81 668  FORMAT(' *** ERROR -- FILE NOT EXISTING *** ')  
82      IF(IERR.LT.0) GO TO 665  
83 C  
84 C** PRINT HEADER AND TITLE INFORMATION  
85 C  
86      WRITE(6,109) (NAME(K),K=1,3),I1  
87 109  FORMAT('1',///,' PROGRAM NAME: JAC71',/,  
88      ' -----',/,  
89      ' DATA FILE: ',3A2,/,  
90      ' -----',/,  
91      ' GEOMAG INDEX: ',15A2,/,  
92      ' -----',/)  
93 C  
94 C*****  
95 C** READ 'INPUT1' DATA VALUES **  
96 C*****  
97 C  
98 C** SKIP 'INPUT1' HEADER RECORD  
99 C  
100     CALL READF(IDC8,IERR,IBUF)  
101 C  
102 C** READ 'ILAT' & 'ILNG'  
103 C  
104     CALL READF(IDC8,IERR,IBUF)  
105     CALL CODE  
106     READ(IBUF,300) ILAT,ILNG  
107     300 FORMAT(9X,13,10X,13)  
108 C  
109 C** READ 'XLATT' ARRAY UP TO 'ILAT' POINTS  
110 C  
111     DO 1 I=1,5
```

```
112      J = (I-1)*10 + 1
113      CALL READF(IDCB,IERR,IBUF)
114      CALL CODE
115      READ(IBUF,301) (XLATT(K),K=J,J+9)
116      301 FORMAT(10X,10(F5.0,1X))
117      1 CONTINUE
118 C
119 C== READ 'XLONG' ARRAY UP TO 'ILNG' POINTS
120 C
121      DO 2 I=1,5
122      J = (I-1)*10 + 1
123      CALL READF(IDCB,IERR,IBUF)
124      CALL CODE
125      READ(IBUF,301) (XLONG(K),K=J,J+9)
126      2 CONTINUE
127 C
128 C== SKIP 'INPUT1' END RECORD
129 C
130      CALL READF(IDCB,IERR,IBUF)
131 C
132 C*****
133 C== ASK USER FOR NUMBER OF CASES 'NCASE' ==
134 C*****
135 C
136      WRITE(LU,102)
137      102 FORMAT('ENTER NCASE: _')
138      READ(LU,*) NCASE
139 C
140 C== LOOP TO PROCESS 'NCASES'
141 C
142      DO 104 INC=1,NCASE
143 C*****
144 C== READ 'INPUT2' DATA BASE VALUES. **
145 C*****
146 C
147 C
148 C== SKIP 'INPUT2' START RECORD
149 C
150      CALL READF(IDCB,IERR,IBUF)
151 C
152 C== READ IZ,Z,XMDJ,F10,F10B, & GI
153 C
154      CALL READF(IDCB,IERR,IBUF)
155      CALL CODE
156      READ(IBUF,302) IZ,Z(1),XMDJ,F10,F10B,GI
157      302 FORMAT(6X,13,3X,F6.1,6X,F6.1,5X,F6.1,6X,F6.1,4X,F6.1)
158 C
159 C== READ IYR,MN,IDA,IHR, & MIN
160 C
161      CALL READF(IDCB,IERR,IBUF)
162      CALL CODE
163      READ(IBUF,303) IYR,MN,IDA,IHR,MIN
164      303 FORMAT(7X,14,4X,12,5X,12,5X,12,5X,12)
165 C
166 C== READ ITEMP,IXH2,102,10,IA,IHE,IH,IEM
```



```
167 C
168     CALL READF(IDC8,IERR,IBUF)
169     CALL CODE
170     READ(IBUF,304) ITEMP,IXN2,IO2,IO,IA,IME,IH,IEM
171     304 FORMAT(9X,13,6X,13,5X,13,4X,13,4X,13,5X,13,4X,13,5X,13)
172 C
173 C== READ IDEN & IDLOG
174 C
175     CALL READF(IDC8,IERR,IBUF)
176     CALL CODE
177     READ(IBUF,305) IDEN,IDLOG
178     305 FORMAT(8X,13,7X,13)
179 C
180 C== INITIALIZE XMJD = 0.0 & IZ = 1
181 C
182     XMJD = 0.0
183     IZ = 1
184 C
185 C== INITIALIZE J COUNTER = 0
186 C
187     J=0
188 C
189 C== LOOP TO PROCESS 'XLAT' DATA
190 C
191     DO 202 III=1,ILAT
192 C
193 C== LOOP TO PROCESS 'XLONG' DATA
194 C
195     DO 201 II=1,ILNG
196         XLAT=XLATT(III)
197         XLNG =XLONG(II)
198 C
199 C== LATITUDE -- LT,  LONGITUDE -- LD
200 C
201     DO 200 I=1,IZ
202         J=J+1
203 C
204 C== CHECK J COUNTER EXCEEDS 30 ?
205 C
206     IF(J-30)52,52,51
207 C
208 C== RESET J COUNTER = 0
209 C
210 51     CONTINUE
211         J=0
212 C
213 C== CALL 'TME' SUBROUTINE
214 C
215     52 CONTINUE
216         DRHO1 = 0.
217         DRHO2 = 0.
218         DRHO3 = 0.
219         DEN = 0.
220         CALL TME(MN,IDA,IYP,IHR,MIN,XMJD,XLAT,XLNG,SDA,SHA,DD,DY)
221 C
```

```
222 C** CALL 'TINF' SUBROUTINE
223 C
224 YDAY = DD
225 CALL TINF(Z(I),F10,F10B,G1,XLAT,SDA,SHA,DY,II,TE,DRHO3)
226 DRHO3(I) = DRHO3
227 T=TE
228 C
229 C** CALL 'JAC' SUBROUTINE
230 C
231 CALL JAC(Z(I),T,TZZ(I),A(1,1),A(1,2),A(1,3),A(1,4),A(1,5),A(1,6),
232 IEN(I),DENS(I),DL(I))
233 DEN = DL(I)
234 C
235 C** CALL SUBROUTINE 'SEAN'
236 C
237 CALL SEAN(DY,DRHO1,Z(I))
238 DRHO1(I) = DRHO1
239 C
240 C** INITIALIZE VARIABLES
241 C
242 ZZ=Z(I)
243 IF(ZZ-170.)20,20,50
244 C
245 C** CALL 'SLV' SUBROUTINE
246 C
247 20 CALL SLV(DRHO2,ZZ,XLAT,YDAY)
248 DRHO2(I) = DRHO2
249 GO TO 40
250 50 IF(ZZ-500.)40,40,30
251 C
252 C** CALL 'SLVH' SUBROUTINE
253 C
254 30 CALL SLVH(DEN,A(1,5),XLAT,SDA)
255 40 CONTINUE
256 DL(I)=DEN
257 DL(I)=DL(I)+DRHO1(I)+DRHO2(I)+DRHO3(I)
258 DENS(I) = 10.*DL(I)
259 XLAT=XLAT+(57.29577951)
260 C
261 C** COMPUTE DENMAT(II,III)
262 C
263 DENMAT(II,III) = DENS(I) * 1000.
264 TEMP(II,III) = TZZ(I)
265 XN2(II,III) = A(1,1)
266 O2MAT(II,III) = A(1,2)
267 OMAT(II,III) = A(1,3)
268 AMAT(II,III) = A(1,4)
269 HEMAT(II,III) = A(1,5)
270 HMAT(II,III) = A(1,6)
271 UTHAT(II,III) = EN(I)
272 DENLOG(II,III) = DL(I)
273 200 CONTINUE
274 201 CONTINUE
275 202 CONTINUE
276 C
```

```
277 C** PERFORM MATRIX PRINTOUT
278 C
279     IF(ITEMP.NE. 0) CALL MATPR(2)
280     IF(IXI/2.NE. 0) CALL MATPR(3)
281     IF(IXI.NE. 0) CALL MATPR(4)
282     IF(IXI.NE. 0) CALL MATPR(5)
283     IF(IXI.NE. 0) CALL MATPR(6)
284     IF(IXI.NE. 0) CALL MATPR(7)
285     IF(IXI.NE. 0) CALL MATPR(8)
286     IF(IXI.NE. 0) CALL MATPR(9)
287     IF(IXI.NE. 0) CALL MATPR(10)
288     104 CONTINUE
289 C
290 C** PROGRAM 'JAC71' COMPLETED
291 C
292 999 STOP
293     END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 1734

COMMON: (NONE)

CZ

```

294 $EMAC(XDATA)
295     SUBROUTINE MATPR(IP)
296 C*****
297 C** SUBROUTINE 'MATPR' PERFORMS THE PRINTOUT OF **
298 C** THE SPECIFIED MATRIX. **
299 C*****
300 C
301 C** COMMON STATEMENTS
302 C
303     COMMON /EDATA/ IYR,IDA,MN,IHR,MIN,XMJD,F10,F10B,G1,ILAT,ILNG,
304     XLAT,XLNG
305     COMMON/XDATA/AMAT(37,37),DENMAT(37,37),DENLOG(37,37),HEMAT(37,37),
306     HMAT(37,37),OMAT(37,37),ONAT(37,37),TEMP(37,37),
307     XN2(37,37),UTMAT(37,37)
308     COMMON /FDATA/ A(300,6),DENLG(300),DENS(300),DL(300),EM(300),
309     T2Z(300),XLATT(300),XLONG(300),Z(300),DRHO1(300),
310     DRHO2(300),DRHO3(300)
311 C
312 C** DIMENSION STATEMENTS
313 C
314     DIMENSION IHEAD(9,10)
315 C
316 C** DATA STATEMENTS
317 C
318     DATA IHEAD/2HDE,2HNS,2HIT,2HIE,2HS ,2HK,2HG/,2HM3,2H/ ,
319     2HTE,2HMP,2H , 2HDE,2HG, 2H K,2H ,2H ,2H ,
320     2H(N,2H2),2H ,2H ,2H ,2H ,2H ,2H ,2H ,
321     2H(O,2H2),2H ,2H ,2H ,2H ,2H ,2H ,2H ,
322     2H(O,2H) ,2H ,2H ,2H ,2H ,2H ,2H ,2H ,
323     2H(A,2H) ,2H ,2H ,2H ,2H ,2H ,2H ,2H ,
324     2H(H,2H) ,2H ,2H ,2H ,2H ,2H ,2H ,2H ,
325     2H(H,2H) ,2H ,2H ,2H ,2H ,2H ,2H ,2H ,
326     2HME,2HAN,2H M,2HOL,2H W,2HT ,2H ,2H ,2H ,
327     2HLO,2HG ,2HDE,2HN ,2H(G,2HM/,2HCM,2H3),2H /
328 C
329 C** COMPUTE NPG
330 C
331     NPG = ILAT / 7
332 C
333 C** LOOP FOR NPG TIMES
334 C
335     IF(MOD(ILAT,7) .NE. 0) NPG = NPG + 1
336     DO 300 II=1,NPG
337     ISTR = (II - 1) * 7 + 1
338     ISTEP = ISTR + 6
339     IF(ISTEP .GT. ILAT) ISTEP = ILAT
340 C
341 C**WRITE HEADER
342 C
343     WRITE(6,7000) (IHEAD(I,IP),I=1,9),II,IYR,IDA,MN,IHR,MIN,XMJD,F10,
344     F10B,G1,Z(1)
345 7000 FORMAT(1H1,29X,9A2,51X,"PAGE ",I2,/,
346     11X,"YR = ",I4,3X,"DAY = ",I2,3X,"MONTH = ",I2,3X,"HOUR = ",I2,3X,
347     2"MIN = ",I2,1X,"XMJD = ",F9.0,3X,"F10 = ",F6.2,3X,
348     3"F10B = ",F6.2,3X,"G1 = ",F6.2,1X,"ALTITUDE = ",F7.1)

```

```
349 C
350 C++ PRINTOUT 'XLATT' ARRAY
351 C
352     WRITE(6,7001) (XLATT(I),I=ISTR,ISTP)
353 7001 FORMAT(1H0,30X,"(-SOUTH) LATITUDES (+NORTH)"/1X,"LON.",8X,
354     17(F5.0,5X))
355     WRITE(6,7003)
356 7003 FORMAT(1H,"(-WEST)"/1X,"(+EAST)"/)
357 C
358 C++ PRINTOUT 'XLONG' ARRAY
359 C
360     DO 250 J=1,ILNG
361     IF(IP.EQ.1) WRITE(6,7002) XLONG(J),(DENMAT(J,I),I=ISTR,ISTP)
362     IF(IP.EQ.2) WRITE(6,7002) XLONG(J),( TENP(J,I),I=ISTR,ISTP)
363     IF(IP.EQ.3) WRITE(6,7002) XLONG(J),(  XN2(J,I),I=ISTR,ISTP)
364     IF(IP.EQ.4) WRITE(6,7002) XLONG(J),( O2MAT(J,I),I=ISTR,ISTP)
365     IF(IP.EQ.5) WRITE(6,7002) XLONG(J),(  OMAT(J,I),I=ISTR,ISTP)
366     IF(IP.EQ.6) WRITE(6,7002) XLONG(J),(  AMAT(J,I),I=ISTR,ISTP)
367     IF(IP.EQ.7) WRITE(6,7002) XLONG(J),(  HEMAT(J,I),I=ISTR,ISTP)
368     IF(IP.EQ.8) WRITE(6,7002) XLONG(J),(  HMAT(J,I),I=ISTR,ISTP)
369     IF(IP.EQ.9) WRITE(6,7002) XLONG(J),(  WMAT(J,I),I=ISTR,ISTP)
370     IF(IP.EQ.10) WRITE(6,7002) XLONG(J),(DENLOG(J,I),I=ISTR,ISTP)
371 7002 FORMAT(1H ,F4.0,4X,7E10.3)
372 250 CONTINUE
373 300 CONTINUE
374 C
375 C++ RETURN TO CALLING PROGRAM
376 C
377     RETURN
378     END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 866 COMMON: (NONE)

```

379      SUBROUTINE TINF(Z,F10,F10B,G1,XLAT,SDA,SHA,DY,I1,TE,DRHO)
380 C*****
381 C** SUBROUTINE 'TINF' CALCULATES THE EXOSPHERIC TEMPERATURE **
382 C** ACCORDING TO JACCHIA 6A0 NO. 313, 1970. **
383 C** **
384 C** F10 = SOLAR RADIO NOISE FLUX (XE-22 WATTS/M**2) **
385 C** F10B= 81-DAY AVERAGE F10 **
386 C** G1 = GEOMAGNETIC ACTIVITY INDEX **
387 C** LAT = GEOGRAPHIC LATITUDE AT PERIGEE (IN RAD) **
388 C** SDA = SOLAR DECLINATION ANGLE (IN RAD) **
389 C** SHA = SOLAR HOUR ANGLE **
390 C** DY = D/Y (DAY NUMBER/TROPICAL YEAR); 1 **
391 C** I1 = GEOMAGNETIC EQUATION INDEX(1--G1=KP, 2--G1=AP. **
392 C** I2 = DIURNAL EQU INDEX (1--R(KP),2--R(F10B),3--R(AVG). **
393 C** RE = DIURNAL FACTOR KP,F10B,AVG. **
394 C** **
395 C** CONSTANTS -- C=SOLAR ACTIVITY VARIATION. **
396 C** -- BETA,ETC. = DIURNAL VARIATION. **
397 C** -- D=GEOMAGNETIC VARIATION. **
398 C** -- E=SIEMIANNUAL VARIATION. **
399 C** **
400 C*****
401 C
402 C** DATA STATEMENTS
403 C
404      DATA C1/379.0/
405      DATA C2/3.24/
406      DATA C3/1.30/
407      DATA P1/3.14159/
408 C
409 C** PERFORM CALCULATIONS
410 C
411      CON = P1/180.
412      BETA= -37.0*CON
413      GAMMA= 43.0*CON
414      P = 6.0*CON
415      XM = 2.2
416      XNN = 3.0
417      R = 0.30
418 C
419 C** INITIALIZE GEOMAGNETIC VARIATION VARIABLES
420 C
421      D1 = 26.0
422      D2 = 0.03
423      D3 = 1.0
424      D4 = 100.0
425      D5 = -0.08
426      D6 = 14.0
427      D7 = 0.02
428      D8 = 0.012
429      D9 = 1.2E-5
430      DRHO = 0.0
431 C
432 C
433 C** SOLAR ACTIVITY VARIATION

```

```

434 C
435 TC = C1 + C2*F10B + C3*(F10 - F10B)
436 C
437 C** DIURNAL VARIATION
438 C
439 ETA = 0.5*ABS(XLAT - SDA)
440 THETA = 0.5*ABS(XLAT + SDA)
441 TAU = SHA + BETA + P*SIN(SHA + GAMMA)
442 TPI=2*PI
443 IF(TAU) 210,230,230
444 210 IF(TAU+PI) 220,250,250
445 220 TAU=TAU+TPI
446 GO TO 210
447 230 IF(TAU-PI) 250,250,240
448 240 TAU=TAU-TPI
449 GO TO 230
450 250 CONTINUE
451 A1 =(SIN(THETA))*XM
452 A2 =(COS(ETA))*XM
453 A3 =(COS(TAU/2.))*XNN
454 B1 = 1.0 + R*A1
455 B2 =(A2-A1)/(1. + R*A1)
456 TV = B1*(1. + R*B2*A3)
457 TL = TC*TV
458 C
459 C** GEOMAGNETIC VARIATION
460 C
461 IF(2 - 170.) 30,30,40
462 30 TG = D6*GI + D7*EXP(GI)
463 DRHO = D8*GI + D9*EXP(GI)
464 GO TO 70
465 40 CONTINUE
466 IF (11-1) 50,50,60
467 50 TG = D1*GI + D2*EXP(GI)
468 GO TO 70
469 60 TG = D3*GI + D4*(1-EXP(D5*GI))
470 70 CONTINUE
471 C
472 C** EXOSPHERIC TEMPERATURE
473 C
474 TE = TL + TG
475 C
476 C** RETURN TO CALLING PROGRAM
477 C
478 RETURN
479 END

```

FTN4X COMPILER: HP92634 REV.2030 (600621)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 465 COMMON: (NONE)

```

480      SUBROUTINE THE(MN,IDA,IYR,IHR,MIN,XMJD,XLAT,XLNG,SDA,SHA,DD,DY)
481 C*****
482 C** SUBROUTINE 'THE' PERFORMS THE CALCULATIONS OF THE SOLAR DECLI- **
483 C** NATION ANGLE AND SOLAR HOUR ANGLE. **
484 C** **
485 C** INPUTS: MN = MONTH **
486 C**          IDA = DAY **
487 C**          IYR = YEAR **
488 C**          IHR = HOUR **
489 C**          MIN = MINUTE **
490 C**          XMJD= MEAN JULIAN DATE (IF=0 THEN XMJD IS CALCULATED) **
491 C**          XLAT= LATITUDE (INPUT-GEOCENTRIC LATITUDE) **
492 C**          XLNG= LONGITUDE (INPUT-GEOCENTRIC LONGITUDE,-180,+180) **
493 C** **
494 C** OUTPUTS: SDA = SOLAR DECLINATION ANGLE (RAD) **
495 C**          SHA = SOLAR HOUR ANGLE (RAD) **
496 C**          DD = DAY NUMBER FROM 1 JAN. **
497 C**          DY = DD/TROPICAL YEAR **
498 C*****
499 C
500 C** DIMENSION STATEMENTS
501 C
502 C      DIMENSION IDAY(12)
503 C
504 C** DATA STATEMENTS
505 C
506 C      DATA IDAY/31,28,31,30,31,30,31,31,30,31,30,31/
507 C      DATA YEAR/365.2422/
508 C
509 C** SET CONSTANTS
510 C
511 C      XLAT=XLAT, 57.29577951
512 C      YR=IYR
513 C      J=IYR-4*(IYR/4)
514 C      IF(J)10,5,10
515 C      5 IDAY(2)=29
516 C      10 CONTINUE
517 C      IF (MN-1) 3,3,4
518 C      3 DD=IDA
519 C      GO TO 6
520 C      4 KE=MN-1
521 C      ID=0
522 C      DO 20 I=1,KE
523 C      ID = ID + IDAY(I)
524 C      20 CONTINUE
525 C      ID = ID + IDA
526 C      DD = ID
527 C      6 DY = DD/YEAR
528 C
529 C** COMPUTE MEAN JULIAN DATE IF XMJD = 0
530 C
531 C      IF(XMJD) 30,25,30
532 C      25 XMJD = 2439856. + 365.*(YR-1968.) + DD
533 C      LDD = (IYR - 1965)/4
534 C      XMJD = XMJD + LDD

```



```
535      30 FMJD = XMJD - 2435639.
536 C
537 C** COMPUTE GREENWICH MEAN TIME IN MINUTES GMT
538 C
539      XHR = INR
540      XMIN = MIN
541      GMT = 60*XHR + XMIN
542 C
543 C** COMPUTE GREENWICH MEAN POSITION - GP (IN DEG)
544 C
545      XJ = (XMJD - 2415020.0)/(36525.0)
546      A1=99.6909833
547      A2 = 36000.76954
548      A3 = 0.00036708
549      A4 = 0.25068447
550      GP = A1 + A2*XJ + A3*XJ*XJ + A4*GMT
551      N = GP/360.
552      XN = N
553      GP = GP - XN*360.
554 C
555 C** COMPUTE RIGHT ASCENSION POINT - RAP (IN DEG)
556 C
557 C** 1ST CONVERT GEOCENTRIC LONGITUDE TO DEG LONGITUDE - WEST NEG + EAST
558 C
559      IFACT = XLNG/180.
560      XFACT = IFACT
561      XLNG=XLNG-360.*XFACT
562 C
563      RAP = GP + XLNG
564      N = RAP/360.
565      XN = N
566      RAP = RAP - XN*360.
567 C
568 C** COMPUTE CELESTIAL LONGITUDE - XLS (IN RAD) - -ZERO TO 2PI
569 C
570      B1 = 0.017203
571      B2 = 0.0335
572      B3 = 1.410
573      Y1 = B1*FMJD
574      XLS = Y1 + B2*SIN(Y1) - B3
575      TPI = 6.28318
576      N = XLS/TPI
577      XN = N
578      XLS = XLS - XN*TPI
579 C
580 C** COMPUTE SOLAR DECLINATION ANGLE - SDA (IN RAD)
581 C
582      B4 = (TPI/360.)*23.45
583      SDA = ASIN(SIN(XLS)*SIN(B4))
584 C
585 C** COMPUTE RIGHT ASCENSION OF SUN - RAS (IN RAD) - -ZERO TO 2PI
586 C
587      RAS = ASIN(TAN(SDA)/TAN(B4))
588 C
589 C** PUT RAS IN SAME QUADRANT AS XLS
```

```
590 C
591     PI = 3.14159
592     PI2 = PI/2.
593     PI32 = 3.*PI2
594     RAS = ABS(RHS)
595     TEMP = ABS(XL8)
596     IF(TEMP - PI2) 130,130,100
597     100 IF(TEMP - PI) 105,105,110
598     105 RAS = PI - RAS
599     GO TO 130
600     110 IF(TEMP - PI32) 115,115,120
601     115 RAS = PI + RAS
602     GO TO 130
603     120 RAS = TPI - RAS
604     130 IF (XL8) 135,140,140
605     135 RAS = -RAS
606     140 CONTINUE
607 C
608 C== COMPUTE SOLAR HOUR ANGLE - SHA (IN DEG) - -
609 C
610     SHA = RAP*(PI/180.) - RAS
611     IF(SHA) 210,230,230
612     210 IF(SHA+PI) 220,250,250
613     220 SHA=SHA+TPI
614     GO TO 210
615     230 IF(SHA-PI) 250,250,240
616     240 SHA=SHA-TPI
617     GO TO 230
618     250 CONTINUE
619 C
620 C++ RETURN TO CALLING PROGRAM
621 C
622     RETURN
623     END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 580 COMMON: (NONE)

```

624      SUBROUTINE JAC(Z,T,TZ,AN,A02,A0,AA,AHE,AH,EM,DENS,DL)
625 C*****
626 C++ SUBROUTINE 'JAC' PERFORMS THE SIMPSONS RULE QUADRA- **
627 C++ TURE (SRQ4) IMPLEMENTED BY G. F. KUNCIR. **
628 C++ **
629 C++ A = LOWER LIMIT OF INTEGRATION **
630 C++ D = UPPER LIMIT OF INTEGRATION **
631 C++ FUNC = INTEGRAND FUNCTION SUBPROGRAM **
632 C++ EPS = RELATIVE ERROR CONVERGENCE CRITERION **
633 C++ M = MAXIMUM NUMBER OF INTEGRATIONS **
634 C++ R = RESULT OF INTEGRATION **
635 C++ N = NUMBER OF INTEGRATIONS REQUIRED TO FIND R **
636 C++ **
637 C*****
638 C
639 C++ DIMENSION STATEMENTS
640 C
641      DIMENSION ALPHA(6),EI(6),DI(6),B(7),DIT(6)
642 C
643 C++ DATA STATEMENTS
644 C
645      DATA QQ/ 90./
646      DATA ALPHA/0.0,0.0,0.0,0.0,0.0,-.380,0.0/
647      DATA AV/6.02257E23/
648      DATA EI/28.0134,31.9988,15.9994,39.948,4.0026,1.00797/
649      DATA B/28.82678,-.0740066,.0119406,4.51102E-4,-8.218947E-6,
650      1.075609E-5,-6.974436E-7/
651      DATA DN/.78110/
652      DATA Q02/.20955/
653      DATA QA/.009343/
654      DATA QHE/1.289E-05/
655      DATA FK/8.31432/
656 C++
657 C++ SET VARIABLES
658 C++
659      ALPHA(1) = 0.0
660      ALPHA(2) = 0.0
661      ALPHA(3) = 0.0
662      ALPHA(4) = 0.0
663      ALPHA(5) = -.38
664      ALPHA(6) = 0.0
665      AV = 6.02257E23
666      EI(1) = 28.0134
667      EI(2) = 31.9988
668      EI(3) = 15.9994
669      EI(4) = 39.948
670      EI(5) = 4.0026
671      EI(6) = 1.00797
672      B(1) = 28.82678
673      B(2) = -.0740066
674      B(3) = -.0119406
675      B(4) = 4.51102E-4
676      B(5) = -8.218947E-6
677      B(6) = 1.075609E-5
678      B(7) = -6.974436E-7

```

```

679      QN = .70110
680      Q02 = .20958
681      QA = .009343
682      QNE = 6.1471E-6
683      FK = 0.31432
684 C
685 C++ PERFORM CALCULATIONS.
686 C
687      T1 = T
688      TX=371.6675+.051850583*T1-294.15049*EXP(-.00216222*T1)
689      A2=2.+(T-TX)/3.14159265
690      D1T(6)=0.
691      M=10
692      EPS=.0001
693      T1=1.9*(TX-183.)/35.
694      T4=3.+(TX-183.-2.+T1*35./3.)/(35.**4)
695      T3=-T1/(3.+35.**2)+4.+T4*35./3.
696      T2=TX+T1*(2-125.)+T3*(2-125.)**3+T4*(2-125.)**4
697      IF (2-100.) 43,43,40
698      43 Z2 = Z - Q0
699      EM=B(1)*B(2)+Z2*B(3)+Z2**2+B(4)*Z2**3+B(5)+Z2**4+B(6)+Z2**5
700      1+B(7)+Z2**6
701      D=Z
702 70  CONTINUE
703      A=90.
704      FA=B(1)+B(2)+(A-Q0)*B(3)+(A-Q0)**2+B(4)*(A-Q0)**3+B(5)*(A-Q0)**4
705      1+B(6)*(A-Q0)**5 +B(7)*(A-Q0)**6
706      FA=FA+9.80655/((1.+A/6.356766E+3)**2)
707      FA=FA/(TX+T1*(A-125.)+T3*(A-125.)**3 +T4*(A-125.)**4)
708      FD=B(1)+B(2)+(D-Q0)*B(3)+(D-Q0)**2+B(4)*(D-Q0)**3+B(5)*(D-Q0)**4
709      1+B(6)*(D-Q0)**5 +B(7)*(D-Q0)**6
710      FD=FD+9.80665/((1.+D/6.356766E+3)**2)
711      FD=FD/(TX+T1*(D-125.)+T3*(D-125.)**3 +T4*(D-125.)**4)
712 C
713 C++ INITIALIZE COUNTERS
714 C
715      N=0
716      PREV=0.
717      SONE=(D-A)*(FA+FD)/2.
718 71  N=N+1
719      IF (N-M) 72,72,75
720 72  NINT=2**N
721      STWO=0.
722      DEL=(D-A)/FLOAT(NINT)
723      DO 73 I=1,NINT,2
724      X=A+DEL*FLOAT(I)
725      FX=B(1)+B(2)*(X-Q0)+B(3)*(X-Q0)**2+B(4)*(X-Q0)**3+B(5)*(X-Q0)**4
726      1+B(6)*(X-Q0)**5 +B(7)*(X-Q0)**6
727      FX=FX+9.80663/((1.+X/6.356766E+3)**2)
728      FX=FX/(TX+T1*(X-125.)+T3*(X-125.)**3 +T4*(X-125.)**4)
729 73  STWO=STWO+FX
730      CUR=SONE+4.*DEL*STWO
731      IF (EPS*ABS(CUR)-ABS(CUR-PREV)) 74,75,75
732 74  PREV=CUR
733      SONE=(SONE+CUR)/4.

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```

734      GO TO 71
735 75    R=CUR/3
736      IF (Z-100.) 44,76,44
737 44    IF (D-100.) 76,55,76
738 76    DENS=3.46E-9+183.*EM*EXP(-R/FK)/(T2+28.82678)
739      DL=ALOGT(DENS)
740      PAR=AV=DENS/EM
741      AH=ALOGT(QH*EM*PAR/28.96)
742      AA=ALOGT(QA*EM*PAR/28.96)
743      AHE=ALOGT(QHE*EM*PAR/28.96)
744      AO=ALOGT(2.*PAR*(1.-EM/28.96))
745      AO2=ALOGT(PAR*(EM*(1.+002)/28.96-1.))
746      AH=-0.
747 C
748 C++ RETURN TO CALLING PROGRAM
749 C
750      RETURN
751 C
752 C++ CONTINUE CALCULATIONS
753 C
754      40 Z3=100.
755      T23=TX+T1*(Z3-125.)+T3*(Z3-125.)*+3+T4*(Z3-125.)*+4
756      ZM3=B(1)*.2+.10.+B(3)*100.+B(4)*1000.+B(5)*10.*+4.+B(6)*10.*+5.
757      1+B(7)*10.*+6.
758      D=100.
759      GO TO 70
760 55    DEN1=3.46E-9+183.*ZM3*EXP(-R/FK)/(T23+28.82678)
761      PAR=AV=DEN1/ZM3
762      DI(1)=QH*ZM3*PAR/28.96
763      DI(2)=PAR*(ZM3*(1.+002)/28.96-1.)
764      DI(3)=2.*PAR*(1.-ZM3/28.96)
765      DI(4)=QA*ZM3*PAR/28.96
766      DI(5)=QHE*ZM3*PAR/28.96
767      IF(Z-125.) 56,56,90
768 56    CONTINUE
769      A1=100.
770      FA1=9.80665/((1.+A1/6.356766E+3)**2)
771      FA1=FA1/(TX+T1*(A1-125.)+T3*(A1-125.)*+3+T4*(A1-125.)*+4)
772      D1=2
773      FD1=9.80665/((1.+D1/6.356766E+3)**2)
774      IF(D1-125.) 45,45,50
775 45    FD1=FD1/(TX+T1*(D1-125.)+T3*(D1-125.)*+3+T4*(D1-125.)*+4)
776      GO TO 51
777 50    FD1=FD1/(TX+A2*ATAN(T1*(D1-125.)*(1.+4.5E-6*(D1-125.)*+2.5)/A2))
778      T2=TX+A2*ATAN(T1*(Z-125.)*(1.+4.5E-6*(Z-125.)*+2.5)/A2)
779 51    N=0
780      PREV=0
781      SONE=(D1-A1)*(FA1+FD1)/2.
782 81    N=N+1
783      IF (N-M) 82,82,85
784 82    NINT=2**N
785      STWO=0.
786      DEL=(D1-A1)/FLOAT(NINT)
787      DO 83 I=1,NINT,2
788      XI=A1+DEL*FLOAT(I)

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```

789      FX1=9.80665/((1.+X1/6.356766E+3)**2)
790      IF(X1-125.) 46,46,52
791      46 FX1=FX1/(TX+T1*(X1-125.)*T3*(X1-125.)*+3+T4*(X1-125.)*+4,
792      GO TO 83
793 52      FX1=FX1/(TX+A2*ATAN(T1*(X1-125.)*(1.+4.5E-6*(X1-125.)*+2.5)/A2))
794 83      STWO=STWO+FX1
795      CUR=NONE+4.*DEL*STWO
796      IF (EPS+ABS(CUR)-ABS(CUR-PREV)) 84,85,85
797 84      PREV=CUR
798      NONE=(NONE+CUR)/4.
799      GO TO 81
800 85      R=CUR/3.
801      DO 41 I=1,5
802      DIT(I)=DIT(I)*(T23/T2)**(1.+ALPHA(I))*EXP(-E(I)*R/FK)
803      41 CONTINUE
804      DENS=0
805      DO 42 I=1,6
806      DENS=DENS+E(I)*DIT(I)/AV
807 42      CONTINUE
808      EM=DENS*AV/(DIT(1)+DIT(2)+DIT(3)+DIT(4)+DIT(5)+DIT(6))
809      DL=ALOGT(DENS)
810      AN=ALOGT(DIT(1))
811      A02=ALOGT(DIT(2))
812      A0=ALOGT(DIT(3))
813      AA=ALOGT(DIT(4))
814      AHE=ALOGT(DIT(5))
815      IF(Z-500.) 47,48,48
816      47 DIT(6)=10.**(-6)
817      48 AH=ALOGT(DIT(6))
818      AN=AMAX1(-0., AN)
819      A02=AMAX1(-0., A02)
820      A0=AMAX1(-0., A0)
821      AA=AMAX1(-0., AA)
822      AHE=AMAX1(-0., AHE)
823      AH=AMAX1(-0., AH)
824 C
825 C** RETURN TO CALLING PROGRAM
826 C
827      RETURN
828 C
829 C** CONTINUE CALCULATIONS
830 C
831 90      S=TX+A2*ATAN(T1+375.*(1.+4.5E-6+375.**2.5)/A2)
832      DI(6)=10.**(73.13-39.4+ALOGT(6)+5.5*ALOGT(S)+ALOGT(S))
833      A1=500.
834      IF(Z-500.) 49,60,60
835      49 A1=2
836      60 FA1=9.80665/((1.+A1/6.356766E+3)**2)
837      FA1=FA1/(TX+A2*ATAN(T1*(A1-125.)*(1.+4.5E-6*(A1-125.)*+2.5)/A2))
838      D1=2
839      IF(Z-500.) 61,62,62
840      61 D1=500.
841      62 FD1=9.80665/((1.+D1/6.356766E+3)**2)
842      FD1=FD1/(TX+A2*ATAN(T1*(D1-125.)*(1.+4.5E-6*(D1-125.)*+2.5)/A2))
843      N=0

```

```

044      PREV=0
045      SONE=(D1-A1)*(FA1+FD1)/2.
046 91      N=N+1
047      IF (N-M) 92,92,95
048 92      NINT=2**N
049      STWO=0.
050      DEL=(D1-A1)/FLOAT(NINT)
051      DO 93 I=1,NINT,2
052      X1=A1+DEL*FLOAT(I)
053      FX1=9.80665/((1.+X1/6.354766E+3)**2)
054      FX1=FX1/(TX+A2*ATAN(T1*(X1-125.)*(1.+4.5E-6*(X1-125.)**2.5)/A2))
055 93      STWO=STWO+FX1
056      CUR=SONE+4.*DEL*STWO
057      IF (EPS+ABS(CUR)-ABS(CUR-PREV)) 94,95,95
058 94      PREV=CUR
059      SONE=(SONE+CUR)/4.
060      GO TO 91
061 95      R=CUR/3.
062      TZ=TX+A2*ATAN(T1*(Z-125.)*(1.+4.5E-6*(Z-125.)**2.5)/A2)
063      IF (Z-500.) 63,64,64
064      63 R=-R
065      64 DIT(6)=DI(6)*(6/TZ)*EXP(-EI(6)-R/PK)
066 C
067 C** LOOP BACK FOR ADDITIONAL CALCULATIONS
068 C
069      GO TO 56
070 C
071 C** RETURN TO CALLING PROGRAM
072 C
073 999      RETURN
074      END

```

FTN4X COMPILER: HP92834 REV.2030 (000821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 2623 COMMON: (NONE)

PAGE 19 FTH. OPT6: LXI 2:13 PM MON., 21 SEP., 1981

```
075      SUBROUTINE SEAN(DY,DENJ,ALT)
076 C*****
077 C** SUBROUTINE 'SEAN' CALCULATES THE **
078 C** SEMIANNUAL VARIATIONS. **
079 C*****
080 C
081 C** BEGIN CALCULATIONS
082 C
083      TPI = 6.28318
084      A2 = DY
085      X1 = (1. + SIN(TPI*A2 + 6.035))*0.5
086      X1 = X1+1.65
087      TAU = A2 + 0.09544*(X1 - 0.5)
088      X1 = SIN(TPI*TAU + 4.137)
089      X2 = SIN(2.*TPI*TAU + 4.259)
090      A1 = (1. + 0.4671*X1)*X2
091      X1 = (ALT+2.331)*5.867E-07 + 0.06328
092      X2 = -ALT+2.868E-03
093      A4 = X1*EXP(X2)
094      A3 = 0.02835 + 0.3817*A1
095      X1 = A3*A4
096      DENJ = X1
097 C
098 C** RETURN TO CALLING PROGRAM
099 C
100      RETURN
101      END
```

FTH4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 167 COMMON: (NONE)


```
902      SUBROUTINE SLV(DEN,ALT,XLAT,DAY)
903 C*****
904 C** SUBROUTINE 'SLV' COMPUTES THE SEASONAL-LATITUDINAL **
905 C** VARIATION OF DENSITY IN THE LOWER THERMOSPHERE (IN **
906 C** ACCORDANCE TO L. JACCHIA IN SAO 332, 1971. THIS AF- **
907 C** FECTS THE DENSITIES BETWEEN 90 AND 160KM. THIS SUB- **
908 C** ROUTINE NEED NOT BE CALLED FOR DENSITIES ABOVE 160KM, **
909 C** BECAUSE NO EFFECT IS OBSERVED. **
910 C** **
911 C** THE VARIATION SHOULD BE COMPUTED AFTER THE CALCULA- **
912 C** TION OF DENSITY DUE TO TEMPERATURE VARIATIONS AND THE **
913 C** DENSITY (DEN) MUST BE IN THE FORM OF A BASE 10 LOG. **
914 C** NO ADJUSTMENTS ARE MADE TO THE TEMPERATURE OR CONSTI- **
915 C** Tuent NUMBER DENSITIES IN THE REGION AFFECTED BY THIS **
916 C** VARIATION. **
917 C** **
918 C** DEN      = DENSITY (LOG10) **
919 C** ALT      = ALTITUDE (KM) **
920 C** XLAT     = LATITUDE (RAD) **
921 C** DAY      = DAY NUMBER **
922 C** **
923 C*****
924 C
925 C** INITIALIZE DENSITY (DEN) = 0.0
926 C
927      DEN = 0.0
928 C
929 C** CHECK IF ALTITUDE EXCEEDS 160KM?
930 C
931      IF (160 - ALT) 999,5,5
932 C
933 C** COMPUTE DENSITY CHANGE IN LOWER THERMOSPHERE
934 C
935      S Z = ALT - 90,
936      X = -0.0013*Z*Z
937      Y = 0.0172*DAY + 1.72
938      P = SIN(Y)
939      SP = SIN(XLAT)
940      SP = SP*SP
941      S = 0.014*Z*EXP(X)
942      D = S*P*SP
943 C
944 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'XLAT'
945 C
946      IF (XLAT) 10,15,15
947      10 D = -D
948      15 DEN = D
949 C
950 C** RETURN TO CALLING PROGRAM
951 C
952 999      RETURN
953      END
```

PAGE 21 SLV OPT6: LXI

2:13 PM MON., 21 SEP., 1981

FTN4X COMPILER: HP92034 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 123 COMMON: (NONE)

```
954      SUBROUTINE SLVH(DEN,DENHE,XLAT,SDA)
955 C*****
956 C** SUBROUTINE 'SLVH' COMPUTES THE SEASONAL-LATITUDINAL **
957 C** VARIATION OF THE HELIUM NUMBER DENSITY (ACCORDING **
958 C** TO L. JACCJIA IN SAO 332, 1971). THIS CORRECTION **
959 C** IS NOT IMPORTANT BELOW ABOUT 500KM. **
960 C** **
961 C** DEN = DENSITY (LOG10) **
962 C** DENHE = HELIUM NUMBER DENSITY (LOG10) **
963 C** XLAT = LATITUDE (RAD) **
964 C** SDA = SOLAR DECLINATION ANGLE (RAD) **
965 C*****
966 C
967 C** PERFORM CALCULATIONS
968 C
969      D0 = 10.**DENHE
970      A = 0.65*(SDA/0.40909079)
971 C
972 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'A'
973 C
974      IF(A) 5,10,10
975      5 A = -A
976      10 B = 0.5*XLAT
977 C
978 C** CHECK TO COMPUTE ABSOLUTE VALUE OF 'B'
979 C
980      IF(SDA) 15,20,20
981      15 B = -B
982 C
983 C** COMPUTE X,Y,DHE, AND DENHE
984 C
985      20 X = 0.7854 - B
986      Y = SIN(X)
987      Y = Y*Y*Y
988      DHE = A*(Y - 0.35356)
989      DENHE = DENHE + DHE
990 C
991 C** COMPUTE HELIUM NUMBER DENSITY CHANGE
992 C
993      D1 = 10.**DENHE
994      DEL = D1 - D0
995      RHO = 10.**DEN
996      DRHO = (6.646E-24)*DEL
997      RHO = RHO + DRHO
998      DEN = ALOGT(RHO)
999 C
1000 C** RETURN TO CALLING PROGRAM
1001 C
1002      RETURN
1003      END
```

PAGE 23 BLVN OPTS: LXI

2:13 PM MON., 21 SEP., 1961

•• NO WARNINGS •• NO ERRORS •• PROGRAM: 149 COMMON: (NONE)

```
1004      BLOCK DATA
1005 C*****
1006 C** THIS IS THE BLOCK DATA FOR THE **
1007 C** 'JAC71' PROGRAM.                  -/
1008 C*****
1009 C
1010 C** COMMON BLOCK DATA
1011 C
1012      COMMON /EDATA/ IYR,IDA,MN,IHR,MIN,XNJD,F10,F10B,G1,ILAT,ILNG,
1013      ,              XLAT,XLNG
1014      COMMON /FDATA/ A(300,6),DENLG(300),DENS(300),DL(300),EM(300),
1015      ,              TZZ(300),XLATT(300),XLONG(300),Z(300),DRHO1(300),
1016      ,              DRHO2(300),DRHO3(300)
1017      END
```

FTH4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: (NONE) COMMON: (NONE)

BLOCK COMMON FDATA SIZE: 10200

BLOCK COMMON EDATA SIZE: 19

JAC71 10042 13347 ACT-091601 JACCHIA '71 MODEL (REEDA SYSTEM)
 MATPR 13350 15111
 TINF 15112 16032
 TME 16033 17136
 JAC 17137 24235
 SEAN 24236 24504
 SLV 24505 24677
 SLVH 24700 25124
 FDATA 25125 51054
 EDATA 51055 51077

OPEN 51100 51442 92067-16125 REV.2001 791018
 CLOSE 51443 51656 92067-16125 REV.2001 791019
 READP 51657 52647 92067-16125 REV.2001 791015
 FTIME 52650 53141 92067-1X301 REV.2013 780731
 MOD 53142 53171 24998-1X107 REV.2001 751101
 #SHVE 53172 53264 92067-1X483 REV.2013 800129
 RMPAR 53265 53327 92068-1X025 REV.2013 781106
 OVRD. 53330 53330 92067-16125 REV.1903 780526
 LURD 53331 53743 92067-1X270 REV.2013 791024
 REIO 53744 54070 92067-1X275 REV.2013 790316
 SESSN 54071 54106 92067-16125 REV.1903 780413
 IFITY 54107 54174 92067-1X293 REV.2013 790118
 ERRO 54175 54264 24998-1X250 REV.2001 771122
 .ITOI 54265 54403 24998-1X055 REV.2013 791017
 #ALRN 54404 54521 92067-1X271 REV.2013 770715
 ERO.E 54522 54522 24998-1X249 REV.2001 750701
 .ASIN 54523 54626 24998-1X373 REV.2026 800222
 .RTOI 54627 54741 24998-1X063 REV.2013 791230
 .EIO. 54742 56157 24998-1X329 REV.2026 800708
 FMTIO 56160 57407 24998-1X328 REV.2030 800818
 .OPN? 57410 57433 24998-1X325 REV.2030 800803
 .FPAU 57434 57537 24998-1X324 REV.2030 800731
 .EXIT 57540 57613 24998-1X320 REV.2030 800731
 .IOCL 57614 57715 92828-1X305 REV.2030 800731
 CODE 57716 57755 24998-1X335 REV.2026 800303
 .FMCV 57756 62220 24998-1X333 REV.2026 800709
 .IOER 62221 62334 24998-1X321 REV.2030 800731
 .UFMP 62335 62347 24998-1X296 REV.2030 800731
 .FIO. 62350 62624 24998-1X330 REV.2026 800708
 .FIOT 62625 62704 24998-1X322 REV.2030 800803
 .RTOR 62705 62777 24998-1X064 REV.2026 800509
 .MXM1 63000 63134 24998-1X110 REV.2026 800303
 P.PHS 63135 63163 92067-16125 REV.1903 740801
 R/W# 63164 63322 92067-16125 REV.1903 781214
 #OPEN 63323 63477 92067-16125 REV.1903 790103
 RW#UB 63500 64045 92067-16125 REV.1903 781003
 RUND# 64046 64170 92067-16125 REV.1903 780801
 LUTRU 64171 64277 92067-1X308 REV.2013 790223
 PNAME 64300 64345 92068-1X035 REV.2013 771121
 LOGLU 64346 64423 92067-1X297 REV.2013 790228
 LINEM 64424 64444 92067-1X477 REV.2013 790126
 PAU.E 64445 64445 24998-1X254 REV.2001 750701
 .IOCM 64446 64505 92828-1X327 REV.2030 800803

24 PAGES RELOCATED 51 PAGES REQ'D 27 PAGES EMA 4 PAGES MSEG
 LINKS:BP PROGRAM:LB LOADITE COMMON:NC
 /LOADR:JAC71 READY AT 2:17 PM MON., 21 SEPT, 1981
 /LOADR:#END

APPENDIX C

PROGRAM JPLOT

```

2      PROGRAM JFLOT(3),ACI-091631 JACCHIA INTERACTIVE PLOT PROGRAM
3 C.....
4 C**
5 C** DESCRIPTION:  PROGRAM 'JFLOT' IS AN INTERACTIVE PLOT
6 C**              PROGRAM WHICH ALLOWS THE USER TO GENERATE
7 C**              VARIOUS TYPES OF JACCHIA PLOTS.
8 C**
9 C** INPUTS:      USER PROVIDES INPUT PARAMETERS VIA 'CRT'.
10 C**             -- LABELS, # OF DATA POINTS, DATA, AXIS
11 C**             -- INFORMATION, SCALING FACTORS, TITLES,
12 C**             -- SUBTITLES, AND ETC.
13 C**
14 C**
15 C** OUTPUTS:     VARIOUS USER SELECTED JACCHIA PLOTS.
16 C**
17 C** WRITTEN BY:  JOHN S. HICKEY (ACI) 533-7530
18 C**             MIKE DICKERSON (ACI) 533-7530
19 C**
20 C.....
21 C
22 C** COMMON STATEMENTS
23 C
24 COMMON IGCBC(192),XORCP,YORCP,IPAR(5)
25 C
26 C** DIMENSION STATEMENTS
27 C
28 DIMENSION ITITL(21),NAME(16),LABV(16),LABH(16),LEG(7),ICV(2),
29 +          IBUF(16),TOT(25),AVG(10),IAYG(5),IAYT(5),LAVG(30),
30 +          YOR(10),LLEG1(8),LLEG2(8),LLEG3(8),
31 +          LLEG4(8),LLEG5(8),LABE1(21),LABE2(21),LABE3(21),
32 +          ISUB1(21),ISUB2(21),ISUB3(21),XC(5,25),YC(5,25),
33 +          YC(5,25)
34 C
35 C** DATA STATEMENTS
36 C
37 DATA ITITL/40,20*2H /           I MAIN TITLE
38 DATA ISUB1/40,20*2H /           I SUBTITLE #1
39 DATA ISUB2/40,20*2H /           I SUBTITLE #2
40 DATA ISUB3/40,20*2H /           I SUBTITLE #3
41 DATA IAYT/ 6,2HAL,2HL ,2HSE,2HTS/ I LABEL FOR ALL SET AVG.
42 DATA IAYG/ 8,2HAV,2HER,2HAG,2HE / I LABEL FOR SET AVERAGE
43 DATA LABV/30,15*2H /            I Y AXIS LABEL
44 DATA LABH/30,15*2H /            I X AXIS LABEL
45 DATA NAME/30,15*2H /            I NAME/PROJECT ID
46 DATA LEG/12,2H*+,2H*L,2HEG,2HEN,2HD+,2H*+/ I LEGEND LABEL
47 DATA ICV/ 2,2H--/              I LEGEND LABEL SPACER
48 DATA IBUF/30,15*2H /           I COLLECTS THE TIME
49 DATA LABE1/40,20*2H /          I EXTRA LABEL 1
50 DATA LABE2/40,20*2H /          I EXTRA LABEL 2
51 DATA LABE3/40,20*2H /          I EXTRA LABEL 3
52 DATA LLEG1/14,7*2H /           I LEGEND LABEL 1
53 DATA LLEG2/14,7*2H /           I LEGEND LABEL 2
54 DATA LLEG3/14,7*2H /           I LEGEND LABEL 3
55 DATA LLEG4/14,7*2H /           I LEGEND LABEL 4
56 DATA LLEG5/14,7*2H /           I LEGEND LABEL 5

```



```

57 DATA LARG/99,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,
58 * 2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,
59 * 2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,
60 * 2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--,2H--/
61 C
62 C * FETCH LOGICAL UNIT
63 C
64 CALL RNPAR(IPAR)
65 LU=IPAR(1)
66 C
67 C CALL SYSTEM TIME AND DATE
68 C
69 CALL FTIME(IBUF(2))
70 C
71 C CLEAR CRT DISPLAY
72 C&Y
73 WRITE(LU,935)
74 935 FORMAT("HEU")
75 C&Z
76 C
77 C ASK USER WHICH PLOT TYPE TO BE USED
78 C
79 WRITE(LU,701)
80 701 FORMAT(/,"DO YOU WANT THE 4 QUADRANT, UPPER RIGHT QUADRANT, ",/,
81 *OR PIE CHART PLOT TYPE. (1=4-QUAD, 2=UR QUAD 3=PIE): _")
82 READ(LU,*) IQTY
83 C
84 C TEST FOR PIE CHART PLOT TYPE
85 C
86 IF(IQTY.EQ.3) CALL PPLOT
87 C
88 C ASK USER IF LINEAR OR SCATTER PLOT DESIRED
89 C
90 WRITE(LU,161)
91 161 FORMAT(/,"DO YOU WANT A LINEAR PLOT, SCATTER PLOT, OR",/,
92 *"BAR GRAPH?",/,
93 *" 1=LINEAR PLOT (SET OF POINTS CONNECTED BY A LINE) ",/,
94 *" 2=SCATTER PLOT (SET OF POINTS NOT CONNECTED BY LINE) ",/,
95 *" 3=BAR GRAPH",/,
96 *"ENTER: _")
97 READ(LU,*) IPLT
98 C
99 C ASK USER IF HE WANTS GRID PATTERN SUPERIMPOSED ON PLOT
100 C
101 WRITE(LU,170)
102 170 FORMAT(/,"DO YOU WANT GRID PATTERN SUPERIMPOSED ON PLOT",/,
103 *"(Y=YES, N=NO, ENTER: _)")
104 READ(LU,172) IGRID
105 172 FORMAT(A1)
106 C
107 C TEST FOR PARTICULAR PLOT TYPE
108 C
109 IF(IPLT.EQ.1) IPLT=-2
110 IF(IPLT.EQ.2) IPLT=-1
111 C

```

```

112 C      ENTER TITLE OF THE PLOT
113 C
114      WRITE(LU,102)
115 102   FORMAT(/,"ENTER PLOT TITLE:  _")
116      READ(LU,103) (TITLE(K), K=2,20)
117 103   FORMAT(19A2)
118 C
119 C      ASK USER FOR ADDITIONAL SUBTITLES
120 C
121      DO 33 ICT=1,3
122      WRITE(LU,310)
123 310   FORMAT(/,"ENTER SUBTITLE. IF NONE WANTED, HIT RETURN KEY.",/,"
124      *" *** ")
125      IF(ICT.EQ.1) READ(LU,320) (SUB1(K), K=2,20)
126      IF(ICT.EQ.2) READ(LU,320) (SUB2(K), K=2,20)
127      IF(ICT.EQ.3) READ(LU,320) (SUB3(K), K=2,20)
128 320   FORMAT(19A2)
129 33    CONTINUE
130 C
131 C      ENTER USER'S NAME
132 C
133      WRITE(LU,104)
134 104   FORMAT(/,"ENTER YOUR NAME  _")
135      READ(LU,105) (NAME(K), K=2,15)
136 105   FORMAT(14A2)
137 C
138 C      ENTER LENGTH OF X AXIS IN INCHES
139 C
140      WRITE(LU,173)
141 173   FORMAT(/,"ENTER X AXIS LENGTH. (MAX=13.0 INCHES) :  _")
142      READ(LU,*) XLEN
143 C
144 C      ASK USER TO ENTER Y AXIS LENGTH
145 C
146      WRITE(LU,174)
147 174   FORMAT(/,"ENTER Y AXIS LENGTH. (MAX=7.25 INCHES) :  _")
148      READ(LU,*) YLEN
149 C
150 C      ENTER THE X AXIS LABEL
151 C
152      WRITE(LU,106)
153 106   FORMAT(/,"ENTER THE X AXIS LABEL  _")
154      READ(LU,107) (LABX(K), K=2,15)
155 107   FORMAT(14A2)
156 C
157 C      ENTER Y AXIS LABEL
158 C
159      WRITE(LU,108)
160 108   FORMAT(/,"ENTER Y AXIS LABEL  _")
161      READ(LU,109) (LABY(K), K=2,15)
162 109   FORMAT(14A2)
163 C
164 C      ASK USER IF HE WANTS ADDITIONAL LABELS
165 C
166      WRITE(LU,123)

```

```

167 122 FORMAT(2,"HOW MANY EXTRA LABELS DO YOU WANT.(MIN=0,MAX=3) _")
168 READ(LU,*) LTD
169 C TEST FOR ZERO L+ELS
170 IF(LTD.EQ.0) GO TO 400
171 C
172 DO 400 ILT=1,LTD
173 WRITE(LU,201)
174 201 FORMAT(2,"ENTER ADDITIONAL LABELS: _")
175 IF(ILT.EQ.1) READ(LU,250) (LABEL(K), K=2,20)
176 IF(ILT.EQ.2) READ(LU,250) (LABEL(K), K=2,20)
177 IF(ILT.EQ.3) READ(LU,250) (LABEL(K), K=2,20)
178 250 FORMAT(19A2)
179 C
180 C ASK FOR COORDINATES OF EXTRA LABELS
181 C
182 WRITE(LU,240)
183 240 FORMAT(2,"ENTER X,Y COORDINATES. (EX: 0.5,7) _")
184 READ(LU,*) PXC,RYC
185 IF(ILT.EQ.1) PXC1=PXC-1.0
186 IF(ILT.EQ.1) RYC1=RYC-1.0
187 IF(ILT.EQ.2) PXC2=PXC-1.0
188 IF(ILT.EQ.2) RYC2=RYC-1.0
189 IF(ILT.EQ.3) PXC3=PXC-1.0
190 IF(ILT.EQ.3) RYC3=RYC-1.0
191 400 CONTINUE
192 C
193 C ENTER NUMBER OF DATA POINTS
194 C
195 WRITE(LU,110)
196 110 FORMAT(2,"ENTER NUMBER OF POINTS FOR LARGEST DATA SET: _")
197 READ(LU,*) NDATA
198 C
199 C ENTER X AXIS MINIMUM AND MAXIMUM VALUES
200 C
201 IF(IQTY.EQ.2) WRITE(LU,111)
202 111 FORMAT(2,"ENTER MINIMUM,MAXIMUM VALUES FOR X AXIS.",/,
203 + "SEPARATE WITH COMMA. (EXAMPLE: 0.,100.) ENTER: _")
204 IF(IQTY.EQ.2) READ(LU,*) XMIN,XMAX
205 IF(IQTY.EQ.1) WRITE(LU,711)
206 711 FORMAT(2,"ENTER MAXIMUM X AXIS VALUE: _")
207 IF(IQTY.EQ.1) READ(LU,*) XMAX
208 C
209 C ENTER NUMBER OF TIC MARKS FOR X AXIS
210 C
211 WRITE(LU,112)
212 112 FORMAT(2,"ENTER NUMBER OF X AXIS TIC MARKS: _")
213 READ(LU,*) XTIC
214 C
215 C ASK USER WHETHER DECIMAL POINTS TO BE SUPPRESSED FOR X AXIS VALS
216 C
217 WRITE(LU,113)
218 113 FORMAT(2,"DO YOU WANT DECIMAL POINTS SUPPRESSED ON X AXIS",/,
219 + "INCREMENT VALUES N=NO, Y=YES : _")
220 READ(LU,119) IFLAG
221 119 FORMAT(1)

```

```

222 IF(IFLAG.EQ.1MY) IDECI=-1
223 IF(IFLAG.EQ.1HN) IDECI=0
224 C
225 C ENTER Y AXIS MINIMUM AND MAXIMUM VALUES
226 C
227 IF(IJTY.EQ.2) WRITE(LU,114)
228 114 FORMAT(//,"ENTER Y AXIS MIN.,MAX. VALUES.",//,
229 * "SEPARATE WITH COMMA. (EX: 0,100) ENTER: _")
230 IF(IJTY.EQ.1) WRITE(LU,214)
231 214 FORMAT(//,"ENTER MAXIMUM Y AXIS VALUE: _")
232 IF(IJTY.EQ.1) READ(LU,*) YMAX
233 IF(IJTY.EQ.2) READ(LU,*) YMIN,YMAX
234 C
235 C ENTER NUMBER OF Y AXIS TIC MARKS
236 C
237 WRITE(LU,139)
238 139 FORMAT(//,"ENTER NUMBER OF Y AXIS TIC MARKS: _")
239 READ(LU,*) YTIC
240 C
241 C ASK USER IF HE WANTS DECIMAL POINTS SUPPRESSED ON Y AXIS
242 C
243 WRITE(LU,115)
244 115 FORMAT(//,"DO YOU WANT DECIMAL POINTS SUPPRESSED ON Y AXIS",//,
245 * "INCREMENT VALUES. ( N=NO, Y=YES ) : _")
246 READ(LU,129) IFLAG
247 129 FORMAT(A1)
248 IF(IFLAG.EQ.1MY) IDEC2=-1
249 IF(IFLAG.EQ.1HN) IDEC2=0
250 C
251 C ENTER NUMBER OF CURVES TO BE PLOTTED
252 C
253 WRITE(LU,116)
254 116 FORMAT(//,"ENTER NO. OF CURVES TO BE PLOTTED. MAXIMUM OF 5. : _")
255 READ(LU,*) NCURV
256 C
257 C ASK USER FOR LEGEND LABEL DEFINITIONS
258 C
259 WRITE(LU,181)
260 181 FORMAT(//,"ENTER LEGEND LABEL DESCRIPTION FOR 1ST DATA SET.",//,
261 * "(12 CHARACTER MAX) : _")
262 READ(LU,182) (LLEG1(K), K=2,7)
263 182 FORMAT(7A2)
264 C
265 C ASK LEGEND FOR 2ND SET
266 C
267 IF(NCURV.LT.2) GO TO 92
268 WRITE(LU,183)
269 183 FORMAT(//,"ENTER LEGEND DESCRIPTION FOR 2ND DATA SET.",//,
270 * "(12 CHARACTER MAX) : _")
271 READ(LU,184) (LLEG2(K), K=2,7)
272 184 FORMAT(7A2)
273 C
274 C ASK LEGEND FOR 3RD SET
275 C
276 IF(NCURV.LT.3) GO TO 92

```

```

277 WRITE(LU,195)
278 195 FORMAT(2,"ENTER LEGEND DESCRIPTION FOR 3RD DATA SET.1.")
279 READ(LU,196) (LLEGCK), K=2,7)
280 196 FORMAT(2A2)
281 C
282 C ASK LEGEND FOR 4TH SET
283 C
284 IF(NCURV.LT.4) GO TO 92
285 WRITE(LU,197)
286 197 FORMAT(2,"ENTER LEGEND DESCRIPTION FOR 4TH DATA SET.1.")
287 READ(LU,198) (LLEGCK), K=2,7)
288 198 FORMAT(2A2)
289 C
290 C ENTER LEGEND FOR 5TH SET
291 C
292 IF(NCURV.LT.5) GO TO 92
293 WRITE(LU,199)
294 199 FORMAT(2,"ENTER LEGEND DESCRIPTION FOR 5TH DATA SET.1.")
295 READ(LU,200) (LLEGCK), K=2,7)
296 200 FORMAT(2A2)
297 C
298 C ASK USER IF LINE OF AVERAGE WANTED
299 C
300 92 WRITE(LU,171)
301 171 FORMAT(2,"DO YOU WANT A LINE OF AVERAGE?",2,
302 *"0=NO LINE OF AVERAGE",2,"1=LINE OF AVERAGE PER SET ",2,
303 *"2=LINE OF AVERAGE FOR ALL SETS ",2,
304 *"3=LINE OF AVERAGE PER SET AND FOR ALL SETS COMBINED",2,
305 *"ENTER _")
306 READ(LU,*) IAV
307 C
308 C ENTER DATA TO BE PLOTTED
309 C
310 C INITIALIZE VARIABLES
311 C
312 IF(IQTY.EQ.2) XINC=XLEN/(XMAX-XMIN)
313 IF(IQTY.EQ.1) XINC=XLEN/(XMAX+2.0)
314 IF(IQTY.EQ.2) YINC=YLEN/(YMAX-YMIN)
315 IF(IQTY.EQ.1) YINC=YLEN/(YMAX+2.0)
316 IF(IQTY.EQ.1) YMIN=-YMAX
317 IF(IQTY.EQ.1) XMIN=-XMAX
318 XTINC=XLEN/XTIC
319 XNC=XTINC
320 XSTAT=XMIN
321 ATOT=0
322 CNTR=0
323 YJNC=YLEN/YTIC
324 C
325 C ENTER THE SET DATA
326 C
327 DO 50 I=1,NCURV
328 YTOT=0.
329 CT=0
330 C
331 C PRINT SPECIFIC DATA SET BEGINNING,

```

```

332 C
333 WRITE(LU,121) I
334 121 FORMAT(2,"ENTER DATA SET N ",I1," . (EXAMPLE: 1,10.)")
335 WRITE(LU,126)
336 126 FORMAT("IF YOU WISH TO TERMINATE A DATA SET BEFORE ",2,
337 "THE MAXIMUM NUMBER OF ENTRIES, ENTER 99.9 .")
338 DO 40 J=1,NDATA
339 C
340 C PRINT DATA ENTRY STATEMENT
341 C
342 IF(J.GE.10) GO TO 129
343 123 WRITE(LU,120) J,J
344 120 FORMAT(2,"ENTER XC",I1," , YC",I1," ) : _")
345 READ(LU,*) XC(1,J),YC(1,J)
346 GO TO 211
347 128 WRITE(LU,167) J,J
348 167 FORMAT(2,"ENTER XC",I2," , YC",I2," ) : _")
349 READ(LU,*) XC(1,J),YC(1,J)
350 C
351 C TEST FOR PREMATURE DATA TERMINATION
352 C
353 211 IF(XC(1,J).EQ.99.9) GO TO 48
354 C
355 C TEST FOR INVALID DATA AND ASK USER TO RE ENTER
356 C
357 IF(XC(1,J).LT.XMIN.OR.XC(1,J).GT.YMAX) GO TO 331
358 GO TO 335
359 331 WRITE(LU,333)
360 333 FORMAT(2,"INVALID DATA, RE ENTER.")
361 GO TO 123
362 335 IF(YC(1,J).LT.YMIN.OR.YC(1,J).GT.YMAX) GO TO 336
363 GO TO 332
364 336 WRITE(LU,334)
365 334 FORMAT(2,"INVALID DATA, RE ENTER.")
366 GO TO 123
367 C
368 C COMPUTE X,Y COORDINATES
369 C
370 332 YC(1,J)=(YC(1,J)-YMIN)*YINC
371 XC(1,J)=(XC(1,J)-XMIN)*XINC
372 YTOT=YTOT+YC(1,J)
373 ATOT=ATOT+YC(1,J)
374 CNTR=CNTR+1.
375 CT=CT+1.
376 40 CONTINUE
377 48 TOT(I)=YTOT
378 C
379 C CALCULATE AVERAGE FOR THE DATA SET
380 C
381 AVG(I)=TOT(I)/CT
382 50 CONTINUE
383 C
384 C COMPUTE AVERAGE FOR ALL CURVES IF UNITED
385 C
386 IF(I.AV.NE.2) GO TO 4.

```

```
397      TOTL=0.
398      DO 44 IA=1,NCURV
399      TOTL=TOTL+AVG(IA)
390      AVALL=ATOT/CNTR
391 44      CONTINUE
392 C
393 C      TEST FOR PARTICULAR QUADRANT PLOT
394 C
395 C      CALL LOGICAL UNITS
396 C
397      CALL PLTLUX(2)
398      CALL LLEFT
399      CALL SFAC(15.,10.)
400      CALL PLOT(1.,1.,-3)
401      CALL PLOT(0.,0.,3)
402 C
403 C      TEST FOR 4 QUAD OR UPPER RIGHT QUAD PLOT TYPE
404 C
405      IF(IQTY.EQ.1) CALL FOUND(XMIN,YMIN,XMAX,YMAX,XLEN,YLEN,IDECL,
406      *IDECL2,XTIC,YTIC,IGRID)
407      IF(IQTY.EQ.1) GO TO 600
408 C
409 C      IF UPPER RIGHT QUADRANT ASKED FOR, WORK FOLLOWING CODE
410 C
411 C      PLOT THE X AXIS
412 C
413      XVALNC=(XMAX-XMIN)/XTIC
414      XI=XMIN
415      IGR=1
416      CALL PLOT(XLEN,0.,2)
417      DO 10 K=1,XTIC
418      XI=XI+XVALNC
419      XSTRT=XSTRT+XTINC
420      IF(K.EQ.1) XINC=0.0+XNC
421      CALL PLOT(XINC,0.05,3)
422      CALL PLOT(XINC,-0.05,2)
423      IF(XI.LT.10.0) AA=.15
424      IF(XI.GE.10.0.AND.XI.LT.100.0) AA=.25
425      IF(XI.GE.100.0.AND.XI.LT.1000.0) AA=.35
426      IF(XI.GE.1000.0.AND.XI.LT.10000.0) AA=.45
427      CALL NUMB(XINC-AA,-.15,.1,XI,0.,IDECL)
428      IF(IGRID.EQ.1HY) CALL GRID(XINC,YLEN,IGR)
429 10      XINC=XINC+XNC
430 C
431 C      PUT X AXIS MINIMUM AT ORIGIN
432 C
433      CALL NUMB(0.,-.15,.1,XMIN,0.,IDECL)
434 C      CALL NUMB(0.,-.15,.1,XMIN,45.0,IDECL)
435 C
436 C      PLOT THE Y AXIS
437 C
438      CALL PLOT(0.,0.,3)
439      CALL PLOT(0.,YLEN,2)
440      YTINC=YJNC
441      YI=YMIN
```

```
442 IGR=2
443 YSTRT=YMIN
444 YVALNC=(YMAX-YMIN)/YTIC
445 DO 20 L=1,YTIC
446 YSTRT=YSTRT+YJNC
447 CALL PLOT(.05,YJNC,3)
448 CALL PLOT(-.05,YJNC,2)
449 YI=YI+YVALNC
450 IF(YI.LT.10.) YS=-.300
451 IF(YI.GE.10.0.AND.YI.LT.100.) YS=-.363
452 IF(YI.GE.100.0.AND.YI.LT.1000.) YS=-.426
453 IF(YI.GE.1000.0.AND.YI.LT.10000.) YS=-.489
454 CALL NUMB(YS,YJNC,.1,YI,0.,IDEC2)
455 IF(IGRID.EQ.1HY) CALL GRID(YJNC,XLEN,IGR)
456 20 YJNC=YJNC+YTINC
457 C
458 C PUT Y AXIS MINIMUM AT THE ORIGIN
459 C
460 IF(YMIN.LT.10.) YS=-.3
461 IF(YMIN.GE.10.0.AND.YMIN.LT.100.) YS=-.363
462 IF(YMIN.GE.100.0.AND.YMIN.LT.1000.) YS=-.426
463 IF(YMIN.GE.1000.0.AND.YMIN.LT.10000.) YS=-.489
464 CALL NUMB(YS,0.0,.1,YMIN,0.,IDEC2)
465 C
466 C FINISHED WITH UPPER RIGHT QUADRANT AXIS PLOT
467 C JUMP OVER 4-QUAD AXIS PLOT CODE
468 C
469 C
470 C PRINT THE TITLE
471 C
472 900 CALL SYMB(2.0,8.4,.20,1TITL,0.,1)
473 C
474 C PRINT 1ST SUBTITLE
475 C
476 CALL SYMB(2.0,8.10,.20,1SUB1,0.,1)
477 C
478 C PRINT 2ND SUBTITLE
479 C
480 CALL SYMB(2.0,7.80,.20,1SUB2,0.,1)
481 C
482 C PRINT 3RD SUBTITLE
483 C
484 CALL SYMB(2.0,7.50,.20,1SUB3,0.,1)
485 C
486 C ENTER LOOP TO POSITION Y AXIS LABEL
487 IFLG=0
488 DO 715 N=2,15
489 IF(LAEV(N).EQ.2H ) IFLG=IFLG+1
490 715 CONTINUE
491 YCL=(YLEN/2.)*(<IFLG+.12)-1.68
492 C
493 C PRINT Y AXIS LABEL
494 C
495 CALL SYMB(-.70,YCL,.12,LAEV,90.,1)
496 C
```



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497 C      ENTER LOOP TO POSITION X AXIS LABEL
498 C
499      IFLG=0
500      DO 725 N=2,15
501      IF(LABH(N).EQ.2H ) IFLG=IFLG+1
502 725      CONTINUE
503      XCL=(XLEN/2.)*(IFLG+.12)-1.68
504 C
505 C      PRINT X AXIS LABEL
506 C
507      CALL SYMB(XCL,-.70,.12,LAEH,0.,1)
508 C
509 C      PRINT 1ST ADDITIONAL LABEL
510 C
511      CALL SYMB(RXC1,RYC1,.12,LABEL,0.,1)
512 C
513 C      PRINT 2ND ADDITIONAL LABEL
514 C
515      CALL SYMB(RXC2,RYC2,.12,LABEL2,0.,1)
516 C
517 C      PRINT 3RD ADDITIONAL LABEL
518 C
519      CALL SYMB(RXC3,RYC3,.12,LABEL3,0.,1)
520 C
521 C      PRINT NAME
522 C
523      CALL SYMB(12.30,-0.85,.08,NAME,0.,1)
524 C
525 C      PRINT THE SYSTEM TIME AND DATE
526 C
527      CALL SYMB(11.60,-1.0,.08,IBUF,0.,1)
528 C
529 C      MAKE LEGEND
530 C
531      CALL SYMB(12.00,8.60,.15,LEG,0.,1)
532 C
533 C      UNDERLINE LEGEND
534 C
535      CALL PLOT(12.00,8.55,3)
536      CALL PLOT(13.750,8.55,2)
537 C
538 C      PLOT DATA
539 C
540 C      INITIALIZE LEGEND PRINT COUNTER
541      COUNT=0
542      ALSZ=XLEN/97.56097
543 C
544 99      DO 70 N=1,NCURV
545 C
546 C      ASK USER WHETHER PAUSE IS WANTED TO CHANGE PEN COLOR
547 C
548      WRITE(LU,144)
549 144      FORMAT(//,"CHANGE PEN NOW AND/OR ENTER '0' TO PROCEED. _")
550      READ(LU,*) ICOL
551 C

```

```

552 C BEGIN ACTUAL DATA PLOT
553 C
554 C YINC=XLEN/(YMAX-YMIN)
555 C XINC=XLEN/(XMAX-XMIN)
556 C DO 80 N=1,NDATA
557 C IF(XCM,N).EQ.99.9) GO TO 81
558 C
559 C TEST FOR BAR GRAPH
560 C
561 C IF(IPLT.NE.3) GO TO 475
562 C
563 C IF BAR GRAPH WANTED WORK FOLLOWING CODE
564 C
565 C IF(N.EQ.1) CALL PLOT(XCM,N)-XINC,YCM,N),3)
566 C IF(N.GT.1) CALL PLOT(XCM,N)-XINC,YCM,N),2)
567 C CALL PLOT(XCM,N),YCM,N),2)
568 C CALL PLOT(XCM,N),0.0,2)
569 C GO TO 80
570 C
571 C IF LINEAR OR SCATTER PLOT WANTED WORK FOLLOWING CODE
572 C
573 475 IF(M.EQ.1) SYM=0.
574 IF(M.EQ.2) SYM=1.
575 IF(M.EQ.3) SYM=2.
576 IF(M.EQ.4) SYM=11.
577 IF(M.EQ.5) SYM=14.
578 IF(N.EQ.1) CALL SYMB(XCM,N),YCM,N),.1,SYM,0.,-1)
579 IF(N.GT.1) CALL SYMB(XCM,N),YCM,N),.1,SYM,0.,IPLT)
580 80 CONTINUE
581 81 IF(IAY.EQ.0) GO TO 94
582 IF(IAY.EQ.2) GO TO 69
583 C
584 C PLOT LINE OF AVERAGE FOR EACH DATA SET
585 C
586 C YCOR(N)=(AVG(N)-YMIN)*YINC
587 C CALL SYMB(0.00,YCOR(N),ALSZ,LAVG,0.,1)
588 C CALL SYMB(XLEN+.1,YCOR(N),.10,IAYG,0.,1)
589 C
590 69 IF(IAY.LT.2) GO TO 94
591 C
592 C PLOT LINE OF AVERAGE FOR ALL DATA SETS
593 C
594 C TAYG=(ALCVS-YMIN)*YINC
595 C CALL PLOT(0.00,AYALL,3)
596 C CALL PLOT(XLEN,AYALL,2)
597 C CALL SYMB(XLEN,AYALL,.10,IAYG,0.,1)
598 C YFIX=AYALL-.20
599 C CALL SYMB(XLEN,YFIX,.10,IAYT,0.,1)
600 C
601 C PRINT LEGEND SYMBOLS AND DEFINITIONS
602 C
603 94 COUNT=COUNT+1
604 C
605 C SET #1 LEGEND LABEL
606 C

```

```
607 IF(COUNT.NE.1) GO TO 95
608 CALL SYMB(12.10,8.40,.12,0.,0.,-1)
609 CALL SYMB(12.20,8.30,0.12,ICV1,0.,1)
610 CALL SYMB(12.50,8.30,0.12,LLEG1,0.,1)
611 C
612 C SET #2 LEGEND LABEL
613 C
614 95 IF(COUNT.NE.2) GO TO 96
615 CALL SYMB(12.10,8.20,.12,1.,0.,-1)
616 CALL SYMB(12.20,8.10,.12,ICV2,0.,1)
617 CALL SYMB(12.50,8.10,.12,LLEG2,0.,1)
618 C
619 C SET #3 LEGEND LABEL
620 C
621 96 IF(COUNT.NE.3) GO TO 97
622 CALL SYMB(12.10,8.00,.12,2.,0.,-1)
623 CALL SYMB(12.20,7.90,.12,ICV3,0.,1)
624 CALL SYMB(12.50,7.90,.12,LLEG3,0.,1)
625 C
626 C SET #4 LEGEND LABEL
627 C
628 97 IF(COUNT.NE.4) GO TO 98
629 CALL SYMB(12.10,7.80,.12,11.,0.,-1)
630 CALL SYMB(12.20,7.70,.12,ICV4,0.,1)
631 CALL SYMB(12.50,7.70,.12,LLEG4,0.,1)
632 C
633 C SET #5 LEGEND LABEL
634 C
635 98 IF(COUNT.NE.5) GO TO 70
636 CALL SYMB(12.10,7.60,.12,14.,0.,-1)
637 CALL SYMB(12.20,7.50,.12,ICV5,0.,1)
638 CALL SYMB(12.50,7.50,.12,LLEG5,0.,1)
639 C
640 70 CONTINUE
641 C
642 C** TERMINATE PLOTTING MODE
643 C
644 CALL URTE
645 C
646 C** PROGRAM TERMINATION
647 C
648 STOP
649 END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 5509 COMMON: 201

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650 SUBROUTINE FOUAD(XMIN,YMIN,XMAX,YMAX,XLEN,YLEN,IOEC1,IOEC2,
651 *XTIC,YTIC,IGRID)
652 C*****
653 C** SUBROUTINE 'FOUAD' WILL GENERATE THE **
654 C** 4-QUADRANT PLOT TYPE. **
655 C*****
656 C
657 C** COMMON STATEMENTS
658 C
659 COMMON ICCD(192),XOFCP,YOFCP,IFAP(5)
660 C
661 C DIMENSION STATEMENTS
662 C
663 C DATA STATEMENTS
664 C
665 900 XVALNC=(XMAX+2)/XTIC
666 XTINC=XLEN/XTIC
667 XINC=XTINC
668 XNC=XTINC
669 IGR=1
670 XI=XMIN
671 C
672 C PLOT BOUNDARIES OF PLOT INCLUDING THE AXES
673 C
674 CALL PLOT(XLEN,0.,2)
675 XMAX=YLEN/2.0
676 CALL PLOT(0.,XMAX,3)
677 CALL PLOT(XLEN,XMAX,2)
678 CALL PLOT(0.,YLEN,3)
679 CALL PLOT(XLEN,YLEN,2)
680 C
681 C ENTER LOOP TO MAKE TIC MARKS WITH VALUES
682 C
683 DO 199 I=1,XTIC
684 XI=XI+XVALNC
685 IF(I.EQ.1) XINC=0.0+XNC
686 C
687 C MAKE TIC MARK
688 C
689 CALL PLOT(XINC,0.05,3)
690 CALL PLOT(XINC,-.05,2)
691 CALL PLOT(XINC,XMAX+.05,3)
692 CALL PLOT(XINC,XMAX-.05,2)
693 C
694 C SET APPROPRIATE SPACING FOR THE TIC MARK VALUE
695 C
696 IF(XI.GT.-10000.0.AND.XI.LE.-1000) AA=.44
697 IF(XI.GT.-1000.0.AND.XI.LE.-100) AA=.36
698 IF(XI.GT.-100.0.AND.XI.LE.-10) AA=.28
699 IF(XI.GT.-10.0.AND.XI.LE.0) AA=.20
700 IF(XI.GE.0.0.AND.XI.LE.10.0) AA=.12
701 IF(XI.GE.10.0.AND.XI.LE.100.0) AA=.20
702 IF(XI.GE.100.0.AND.XI.LE.1000.0) AA=.28
703 IF(XI.GE.1000.0.AND.XI.LE.10000.0) AA=.36
704 CALL NUMB(XINC-AA,-.15,.08,XI,0.,IOEC1)

```

```
705 C
706 C TEST FOR GRID PATTERN
707 C
708 C IF(IGRID.EQ.1HY) CALL GRID(XINC,YLEN,IGR)
709 199 XINC=XINC+XNC
710 C
711 C PUT X AXIS MINIMUM AT BOTTOM
712 C
713 C XAA=-AA/1.1
714 C CALL NUMB(XAA,-.15,.08,XMIN,0.,IDEC1)
715 C
716 C PLOT THE Y AXIS
717 C
718 C YJNC=YLEN/YTIC
719 C YMYN=XLEN/2.0
720 C
721 C PLOT Y-AXIS AND BOUNDARY
722 C
723 C CALL PLOT(0.,0.,3)
724 C CALL PLOT(0.,YLEN,2)
725 C CALL PLOT(YMYN,0.,3)
726 C CALL PLOT(YMYN,YLEN,2)
727 C CALL PLOT(XLEN,0.,3)
728 C CALL PLOT(XLEN,YLEN,2)
729 C YJNC=YJNC
730 C YI=YMIN
731 C IGR=2
732 C YVALNC=(YMAX*2.0)/YTIC
733 C
734 C ENTER LOOP TO PLOT TIC MARKS WITH VALUES
735 C
736 C DO 209 K=1,YTIC
737 C
738 C MAKE TIC MARK
739 C CALL PLOT(.05,YJNC,3)
740 C CALL PLOT(-.05,YJNC,2)
741 C CALL PLOT(YMYN+.05,YJNC,3)
742 C CALL PLOT(YMYN-.05,YJNC,2)
743 C YI=YI+YVALNC
744 C
745 C SET APPROPRIATE SPACING FOR TIC MARK VALUE
746 C
747 C IF(YI.LE.-10000) YS=-.5212
748 C IF(YI.GT.-10000.0.AND.YI.LT.-1000.) YS=-.4712
749 C IF(YI.GT.-1000.0.AND.YI.LE.-100.) YS=-.4208
750 C IF(YI.GT.-100.0.AND.YI.LE.-10.) YS=-.3704
751 C IF(YI.GT.-10.0.AND.YI.LE.0) YS=-.320
752 C IF(YI.GE.0.0.AND.YI.LT.10.) YS=-.250
753 C IF(YI.GE.10.0.AND.YI.LT.100.) YS=-.3004
754 C IF(YI.GE.100.0.AND.YI.LT.1000.) YS=-.3508
755 C IF(YI.GE.1000.0.AND.YI.LT.10000.) YS=-.4012
756 C IF(YI.GE.10000.) YS=-.4512
757 C
758 C PRINT VALUE
759 C
```

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```
760      CALL NUMB(YS,YJNC,.08,YI,0.,IDEC2)
761 C
762 C      TEST FOR GRID PATTERN
763      IF(IGRID.EQ.1HY) CALL GRID(YJNC,XLEN,IGR)
764 209    YJNC=YJNC+YIINC
765 C
766 C      PUT Y AXIS MINIMUM AT BOTTOM
767 C
768      IF(YMIN.LE.-10000.)          YS=-.5212
769      IF(YMIN.GT.-10000.0.AND.YMIN.LE.-1000.) YS=-.4712
770      IF(YMIN.GT.-1000.0.AND.YMIN.LE.-100.) YS=-.4208
771      IF(YMIN.GT.-100.0.AND.YMIN.LE.-10.) YS=-.3704
772      IF(YMIN.GT.-10.0.AND.YMIN.LE.0.) YS=-.320
773      IF(YMIN.GE.0.0.AND.YMIN.LT.10.) YS=-.250
774      IF(YMIN.GE.10.0.AND.YMIN.LT.100.) YS=-.3004
775      IF(YMIN.GE.100.0.AND.YMIN.LT.1000.) YS=-.3508
776      IF(YMIN.GE.1000.0.AND.YMIN.LT.10000.) YS=-.4012
777      IF(YMIN.GE.10000.) YS=-.4512
778      CALL NUMB(YS,0.0,.08,YMIN,0.,IDEC2)
779 C
780 C**    RETURN TO CALLING PROGRAM
781 C
782      RETURN
783      END
```

FTN4X COMPILER: HP92834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 848 COMMON: 201

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784      SUBROUTINE GRID(AINC,ALEN,IGR)
785 C*****
786 C** SUBROUTINE 'GRID' WILL SUPERIMPOSE A **
787 C** GRID PATTERN OVER THE PLOT. **
788 C*****
789 C
790 C**  COMMON STATEMENTS
791 C
792      COMMON IGCB(132),XOPCP,YOPCP,IPAP(5)
793 C
794 C  DIMENSION STATEMENTS
795 C
796 C  DATA STATEMENTS
797 C
798 C  CALL LOGICAL UNITS
799 C
800 C  CALL PLTLU(12)
801 C  CALL LLEFT
802 C  CALL SFACT(13.,10.)
803 C
804 C  VERTICAL LINES
805 C
806      IF(IGR.NE.1) GO TO 22
807      CALL PLOT(AINC,0.00,3)
808      CALL PLOT(AINC,ALEN,2)
809      GO TO 77
810 C
811 C  HORIZONTAL LINES
812 C
813 22  CALL PLOT(0.00,AINC,3)
814      CALL PLOT(ALEN,AINC,2)
815 C
816 C**  RETURN TO CALLING PROGRAM
817 C
818 77  RETURN
819      END

```

FTH4X COMPILER: HP92634 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 37 COMMON: 201

```

020      SUBROUTINE PPLOT
021 C*****
022 C** SUBROUTINE 'PPLOT' GENERATES A PIE **
023 C** CHART GRAPH PLOT. **
024 C*****
025 C
026 C** COMMON STATEMENTS
027 C
028      COMMON IGOB(192),XORCP,YORCP,IPAR(5)
029 C
030 C      DIMENSION STATEMENTS
031 C
032      DIMENSION IDUM(10),LAB1(10),IDUM2(10),LAB2(10),LAB3(10),LAB4(10),
033      *LAB5(10),DAT(10),DPCT(10),ITIT(21),ISUB(21),
034      *LAB6(10),LAB7(10),LAB8(10),LAB9(10),LAB10(10),IFER(2),IEX(10),
035      *X(360),Y(360),XC(360),YC(360),LPCC(2),IAPC(2)
036 C
037 C      DATA STATEMENTS
038 C
039      DATA IFER/2,2H% /
040      DATA LPCC/2,2H% /
041      DATA IAPC/2,2H% /
042      DATA ITIT/40,20*2H /
043      DATA ISUB/40,20*2H /
044      DATA LAB1/18,9*2H /
045      DATA LAB2/18,9*2H /
046      DATA LAB3/18,9*2H /
047      DATA LAB4/18,9*2H /
048      DATA LAB5/18,9*2H /
049      DATA LAB6/18,9*2H /
050      DATA LAB7/18,9*2H /
051      DATA LAB8/18,9*2H /
052      DATA LAB9/18,9*2H /
053      DATA LAB10/18,9*2H /
054 C
055 C** FETCH LOGICAL UNIT
056 C
057      CALL RMPAR(IPAR)
058      LU=IPAR(1)
059 C
060 C      ENTER TITLE OF PIE CHART
061 C
062      WRITE(LU,201)
063 201      FORMAT(/,"ENTER GRAPH TITLE: _")
064      READ(LU,202) (ITIT(K), K=2,20)
065 202      FORMAT(19A2)
066 C
067 C      ASK USER FOR ANY ADDITIONAL SUBTITLE
068 C
069      WRITE(LU,203)
070 203      FORMAT(/,"ENTER SUBTITLE. IF NONE WANTED, HIT RETURN KEY.",/,
071      *" **** _")
072      READ(LU,204) (ISUB(K), K=2,20)
073 204      FORMAT(19A2)
074 C

```

```

I PIE PLOT TITLE
I SUBTITLE
I SLICE LABEL 1
I SLICE LABEL 2
I SLICE LABEL 3
I SLICE LABEL 4
I SLICE LABEL 5
I SLICE LABEL 6
I SLICE LABEL 7
I SLICE LABEL 8
I SLICE LABEL 9
I SLICE LABEL 10

```



```

075 C      ASK USER FOR NUMBER OF PIE SLICES
076 C
077        WRITE(LU,101)
078 101    FORMAT(/,"ENTER NUMBER OF PIE SLICES.  _")
079        READ(LU,*) NPCS
080 C
081 C      INITIALIZE DATA
082 C
083        TOTD=0.0
084        DTFC=0.0
085        RINDEX=.25
086 C
087 C      ENTER LOOP TO ENTER DATA
088 C
089        DO 10 I=1,NPCS
090          WRITE(LU,102)
091 102      FORMAT(/,"ENTER DATA ITEM.  _")
092          READ(LU,*) DNT(I)
093          IF(I.GE.10) GO TO 128
094          WRITE(LU,103) I
095 103      FORMAT(/,"ENTER LABEL #",I1," (MAX=18 CHARACTERS);  _")
096          IF(I.EQ.1) READ(LU,104) (LAB1(M), M=2,9)
097          IF(I.EQ.2) READ(LU,104) (LAB2(M), M=2,9)
098          IF(I.EQ.3) READ(LU,104) (LAB3(M), M=2,9)
099          IF(I.EQ.4) READ(LU,104) (LAB4(M), M=2,9)
100          IF(I.EQ.5) READ(LU,104) (LAB5(M), M=2,9)
101          IF(I.EQ.6) READ(LU,104) (LAB6(M), M=2,9)
102          IF(I.EQ.7) READ(LU,104) (LAB7(M), M=2,9)
103          IF(I.EQ.8) READ(LU,104) (LAB8(M), M=2,9)
104          IF(I.EQ.9) READ(LU,104) (LAB9(M), M=2,9)
105 104      FORMAT(9A2)
106 128      IF(I.EQ.10) WRITE(LU,105) I
107 105      FORMAT(/,"ENTER DATA LABEL #",I2," (MAX=18 CHAR);  _")
108          IF(I.EQ.10) READ(LU,106) (LAB10(M), M=2,9)
109 106      FORMAT(9A2)
110          WRITE(LU,301)
111 301      FORMAT(/,"EXPLODE? (Y=YES, N=NO);  _")
112          READ(LU,302) IEXP
113 302      FORMAT(A1)
114          IF(IEXP.EQ.1HY) IEX(I)=1
115          IF(IEXP.EQ.1HN) IEX(I)=0
116          TOTD=TOTD+DNT(I)
117 10      CONTINUE
118 C
119 C      CALL LOGICAL UNITS
120 C
121        CALL PLTLUX(12)
122        CALL LLEFT
123        CALL SFACT(15.,10.)
124        CALL PLOT(1.,1.,-3)
125        CALL PLOT(0.,0.,3)
126 C
127 C      PRINT TITLE
128 C
129 C      ENTER LOOP TO FIND MIDDLE POSITION FOR TITLE

```

```

930      IFLG=0
931      DO 65 J=2,20
932      IF(ITIT(J).EQ.2H ) IFLG=IFLG+1
933 65    CONTINUE
934      XTIT=2.50*(IFLG+.2)
935      CALL SYMB(XTIT,8.00,.20,ITIT,0.,1)
936 C
937 C      PRINT SUBTITLE
938 C
939 C      ENTER LOOP TO FIND MIDDLE POSITION FOR SUBTITLE
940      IFLG=0
941      DO 75 J=2,20
942      IF(ISUB(J).EQ.2H ) IFLG=IFLG+1
943 75    CONTINUE
944      XTIT=3.5*(IFLG+.15)
945      CALL SYMB(XTIT,7.75,.15,ISUB,0.,1)
946 C
947 C      COMPUTE PERCENTAGE
948 C
949      DO 30 K=1,NPCS
950      XST=6.5
951      XLS=0.
952      YST=3.5
953      RAD=3.0
954      DPCT(K)=(DAT(K)/TOTD)*360.
955      PCT=(DAT(K)/TOTD)*100.0
956      SDTPC=DTPC
957      DTFC=DTFC+DPCT(K)
958      PLAC=DTFC-(DPCT(K)/2.0)
959 C
960 C      CALCULATE SLICE CUT
961 C
962      EXX=RADEX+COS(PLAC+.01745329252)*XST
963      EXY=RADEX+SIN(PLAC+.01745329252)*YST
964      IF(IEK(K).EQ.1) XST=EXX
965      IF(IEK(K).EQ.1) YST=EXY
966      XC(K)=RAD+COS(DTPC+.01745329252)*XST
967      YC(K)=RAD+SIN(DTPC+.01745329252)*YST
968      XEX=PHD+COS(SDTPC+.01745329252)*XST
969      YEX=RAD+SIN(SDTPC+.01745329252)*YST
970 C
971 C      CALCULATE PLACEMENT OF PERCENTAGE FIGURE
972 C
973      IF(PCT.LT.3) GO TO 417
974      IF(PCT.GE.3) SBT=.60
975      XCP=(RAD-SBT)*COS(PLAC+.01745329252)*XST
976      YCP=(RAD-SBT)*SIN(PLAC+.01745329252)*YST
977 C
978 C      TEST PERCENTAGE FOR CORRECT PLACEMENT OF LABEL
979 C
980 417  IF(PLAC.LE.90.0.OR.PLAC.GE.270.) XLS=.10
981 C
982 C      PLOT LINES OF SLICE
983      CALL PLOT(XST,YST,3)
984      CALL PLOT(XC(K),YC(K),2)

```

```

985 CALL PLOT(XST,YST,3)
986 CALL PLOT(XEX,YEX,2)
987 C
988 C DRAW PIE BOUNDARIES
989 C
990 DO 20 J=SDTPC,DTPC
991 X(J)=RAD*COS(FLOAT(J)*.01745329252)*XST
992 Y(J)=RAD*SIN(FLOAT(J)*.01745329252)*YST
993 IF(J.EQ.SDTPC) CALL PLOT(X(J),Y(J),3)
994 CALL PLOT(X(J),Y(J),2)
995 20 CONTINUE
996 C
997 C PLOT LINE TO DATA LABEL
998 C
999 XCL=RAD*COS(PLAC*.01745329252)*XST
1000 YCL=RAD*SIN(PLAC*.01745329252)*YST
1001 CALL PLOT(XCL,YCL,3)
1002 XCLL=(RAD+.50)*COS(PLAC*.01745329252)*XST
1003 YCLL=(RAD+.50)*SIN(PLAC*.01745329252)*YST
1004 CALL PLOT(XCLL,YCLL,2)
1005 C
1006 C PRINT PERCENTAGE
1007 C
1008 IF(PCT.LT.3.) GO TO 775
1009 CALL NUMB(XCP,YCP,.12,PCT,0.0,-1)
1010 IF(PCT.LT.10) XCP=XCP+.12
1011 IF(PCT.GE.10) XCP=XCP+.25
1012 CALL SYMB(XCP,YCP,.12,IPEF,0.0,1)
1013 C
1014 C PRINT LABEL FOR DATA DESCRIPTION
1015 C
1016 C TEST IF LABEL ON RIGHT SIDE OF PIE
1017 775 IF(XLS.EQ..10) XCL=XCLL+XLS
1018 IF(XLS.EQ..10.AND.PCT.GE.3.0) GO TO 123
1019 C
1020 C INITIALIZE VARIABLE
1021 C
1022 IFLG=0
1023 C
1024 C TEST FOR 1ST LABEL
1025 C
1026 IF(K.NE.1) GO TO 222
1027 C
1028 C ENTER LOOP TO POSITION LABEL 1
1029 C
1030 DO 45 N=2,9
1031 IF(LAB1(N).EQ.2H ) IFLG=IFLG+1
1032 45 CONTINUE
1033 C
1034 C TEST FOR 2ND LABEL
1035 C
1036 222 IF(K.NE.2) GO TO 333
1037 C
1038 C ENTER LOOP TO POSITION LABEL 2
1039 C

```

```
1040      DO 55 N=2,9
1041      IF(LAB2(N).EQ.2H ) IFLG=IFLG+1
1042 55      CONTINUE
1043 C
1044 C      TEST FOR 3RD LABEL
1045 C
1046 333      IF(K.NE.3) GO TO 444
1047 C
1048 C      ENTER LOOP TO POSITION LABEL 3
1049 C
1050      DO 66 N=2,9
1051      IF(LAB3(N).EQ.2H ) IFLG=IFLG+1
1052 66      CONTINUE
1053 C
1054 C      TEST FOR 4TH LABEL
1055 C
1056 444      IF(K.NE.4) GO TO 555
1057 C
1058 C      ENTER LOOP TO POSITION LABEL 4
1059 C
1060      DO 77 N=2,9
1061      IF(LAB4(N).EQ.2H ) IFLG=IFLG+1
1062 77      CONTINUE
1063 C
1064 C      TEST FOR 5TH LABEL
1065 C
1066 555      IF(K.NE.5) GO TO 666
1067 C
1068 C      ENTER LOOP TO POSITION LABEL 5
1069 C
1070      DO 88 N=2,9
1071      IF(LAB5(N).EQ.2H ) IFLG=IFLG+1
1072 88      CONTINUE
1073 C
1074 C      TEST FOR 6TH LABEL
1075 C
1076 666      IF(K.NE.6) GO TO 777
1077 C
1078 C      ENTER LOOP TO POSITION LABEL 6
1079 C
1080      DO 99 N=2,9
1081      IF(LAB6(N).EQ.2H ) IFLG=IFLG+1
1082 99      CONTINUE
1083 C
1084 C      TEST FOR 7TH LABEL
1085 C
1086 777      IF(K.NE.7) GO TO 888
1087 C
1088 C      ENTER LOOP TO POSITION LABEL 7
1089 C
1090      DO 707 N=2,9
1091      IF(LAB7(N).EQ.2H ) IFLG=IFLG+1
1092 707      CONTINUE
1093 C
1094 C      TEST FOR 8TH LABEL
```

```

1095 808 IF(K.NE.8) GO TO 999
1096 C
1097 C ENTER LOOP TO POSITION LABEL 8
1098 C
1099 DO 809 N=2,9
1100 IF(LAB8(N).EQ.2H ) IFLG=IFLG+1
1101 809 CONTINUE
1102 C
1103 C TEST FOR 9TH LABEL
1104 C
1105 999 IF(K.NE.9) GO TO 1000
1106 C
1107 C ENTER LOOP TO POSITION LABEL 9
1108 C
1109 DO 909 N=2,9
1110 IF(LAB9(N).EQ.2H ) IFLG=IFLG+1
1111 909 CONTINUE
1112 C
1113 C TEST FOR 10TH LABEL
1114 C
1115 1000 IF(K.NE.10) GO TO 199
1116 C
1117 C ENTER LOOP TO POSITION LABEL 10
1118 C
1119 DO 144 N=2,9
1120 IF(LAB10(N).EQ.2H ) IFLG=IFLG+1
1121 144 CONTINUE
1122 C
1123 C CALCULATION FOR LABEL POSITION
1124 C
1125 199 IF(XLS.EQ..10) GO TO 123
1126 POS=1.6
1127 IF(PCT.LT.3.) POS=2.2
1128 XCL=XCLL+(IFLG*.2)-POS
1129 C
1130 C TEST FOR AND PRINT CORRECT LABEL
1131 C
1132 123 IF(K.EQ.1) CALL SYMB(XCL,YCLL,.10,LAB1,0.,1)
1133 IF(K.EQ.2) CALL SYMB(XCL,YCLL,.10,LAB2,0.,1)
1134 IF(K.EQ.3) CALL SYMB(XCL,YCLL,.10,LAB3,0.,1)
1135 IF(K.EQ.4) CALL SYMB(XCL,YCLL,.10,LAB4,0.,1)
1136 IF(K.EQ.5) CALL SYMB(XCL,YCLL,.10,LAB5,0.,1)
1137 IF(K.EQ.6) CALL SYMB(XCL,YCLL,.10,LAB6,0.,1)
1138 IF(K.EQ.7) CALL SYMB(XCL,YCLL,.10,LAB7,0.,1)
1139 IF(K.EQ.8) CALL SYMB(XCL,YCLL,.10,LAB8,0.,1)
1140 IF(K.EQ.9) CALL SYMB(XCL,YCLL,.10,LAB9,0.,1)
1141 IF(K.EQ.10) CALL SYMB(XCL,YCLL,.10,LAB10,0.,1)
1142 C
1143 C IF PERCENTAGE LESS THAN 3% PRINT PCT AFTER LABEL
1144 C
1145 IF(PCT.GE.3.) GO TO 30
1146 IF(XLS.NE..10) XCL=XCL-.60
1147 IF(XLS.EQ..10) XCL=XCL-(IFLG*.12)+1.48
1148 CALL SYMB(XCL,YCLL,.12,LPOC,0.,1)
1149 XCL=XCL+.12

```

PAGE 23 PLOT OPTS: LXI 3:53 PM TUE , 22 SEP., 1981

```
1150 CALL NUMB(XCL,YCLL,.12,PCT,0.,-1)
1151 XCL=XCL+.12
1152 CALL SYMB(XCL,YCLL,.12,IPER,0.,1)
1153 XCL=XCL+.12
1154 CALL SYMB(XCL,YCLL,.12,IPPC,0.,1)
1155 30 CONTINUE
1156 C
1157 C** TERMINATE PLOTTING MODE
1158 C
1159 CALL UPITE
1160 C
1161 C** RETURN TO CALLING PROGRAM
1162 C
1163 RETURN
1164 END
```

FTN4X COMPILER: HP52834 REV.2030 (800821)

** NO WARNINGS ** NO ERRORS ** PROGRAM: 4920 COMMON: 201

JON 32042 32352
 JPLOT 32353 45157 ACI-091681 JACOBIN INTERACTIVE PLOT PROGRAM
 EQUAD 45160 46677
 GRID 46700 46744
 PPLOT 46745 60434
 PLOT 60435 60761
 SYMB 60762 62236
 AXIS 62237 63433
 LINES 63434 64151
 SCALE 64152 65026
 NUMB 65027 65657

FTIME 65660 66151 92067-1X301 REV.2013 780731
 RMPHR 66152 66214 92068-1X025 REV.2013 781106
 IABS 66215 66227 24998-1X147 REV.2001 750701
 ERRO 66230 66317 24998-1X250 REV.2001 771122
 ERRE 66320 66320 24998-1X249 REV.2001 750701
 .RTOI 66321 66433 24998-1X063 REV.2013 791230
 .EIO. 66434 67651 24998-1X329 REV.2026 800708
 .ENTIO 67652 71101 24998-1X328 REV.2020 800818
 .OPNO 71102 71125 24998-1X325 REV.2030 800303
 .FPAU 71126 71231 24998-1X324 REV.2030 800731
 .EXIT 71232 71305 24998-1X320 REV.2030 800731
 .IOCL 71306 71407 92828-1X305 REV.2030 800731
 .FMCV 71410 73652 24998-1X333 REV.2026 800709
 .IOER 73653 73766 24998-1X321 REV.2030 800731
 .UFHP 73767 74001 24998-1X296 REV.2030 800731
 .FIO. 74002 74256 24998-1X330 REV.2026 800708
 .FIOI 74257 74336 24998-1X322 REV.2030 800803
 ABS 74337 74345 24998-1X176 REV.2001 750701
 .RTOR 74346 74440 24998-1X064 REV.2026 800509
 PHANE 74441 74506 92068-1X035 REV.2013 771121
 LUGLU 74507 74564 92067-1X297 REV.2013 790226
 REIO 74565 74711 92067-1X275 REV.2013 790316
 LIMEN 74712 74732 92067-1X477 REV.2013 790126
 PAUL 74733 74733 24998-1X254 REV.2001 750701
 .IOCM 74734 74773 92828-1X327 REV.2030 800803

19 PAGES RELOCATED 19 PAGES REQ'D NO PAGES EMA NO PAGES MSEG
 LINKS:BP PROGRAM:BG LOAD:ITE COMMON:NC
 /LOADR:JPLOT READY AT 3:57 PM TUE., 22 SEPT, 1981

/LOADR:END

APPENDIX D

DATA BASE JAC70D & JAC71D

JAC70D T=00003 IS ON CR00033 USING 00005 BLKS R=0000

```
0001  **START 'INPUT1' DATA BASE
0002      ILAT  = 19,  ILNG  = 36
0003      XLATT = -090.,-080.,-070.,-060.,-050.,-040.,-030.,-020.,-010., 000.,
0004              010., 020., 030., 040., 050., 060., 070., 080., 090., 000.,
0005              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.,
0006              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.,
0007              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.
0008      XLONGG= 010., 020., 030., 040., 050., 060., 070., 080., 090., 100.,
0009              110., 120., 130., 140., 150., 160., 170., 180., 190., 200.,
0010              210., 220., 230., 240., 250., 260., 270., 280., 290., 300.,
0011              310., 320., 330., 340., 350., 360., 000., 000., 000., 000.,
0012              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.
0013  ** END 'INPUT1' DATA BASE
0014  ** START 'INPUT2' DATA BASE
0015      IZ= 00,Z= 185.0,XMJD= 0.0,F10= 100.0,F10B= 100.0,G1= 00.0
0016      IYR=1968,NN=06,IDA=20,IHR=12,MIN=00
0017      ITEMP= 01,IXN2= 01,IQ2= 01,IO= 01,IA= 01,IHE= 01,IH= 01,IEM= 01
0018      IDEN= 01,IDLOG= 01
0019  ** END 'INPUT2' DATA BASE
```

JAC71D T=00003 IS ON CR00037 USING 00005 BLKS R=0000

```
0001  **START 'INPUT1' DATA BASE
0002      ILAT = 19,  ILNG = 36
0003      XLATT = -090.,-080.,-070.,-060.,-050.,-040.,-030.,-020.,-010., 000.,
0004              010., 020., 030., 040., 050., 060., 070., 080., 090., 000.,
0005              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.,
0006              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.,
0007              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.
0008      XLONGG= 010., 020., 030., 040., 050., 060., 070., 080., 090., 100.,
0009              110., 120., 130., 140., 150., 160., 170., 180., 190., 200.,
0010              210., 220., 230., 240., 250., 260., 270., 280., 290., 300.,
0011              310., 320., 330., 340., 350., 360., 000., 000., 000., 000.,
0012              000., 000., 000., 000., 000., 000., 000., 000., 000., 000.
0013  ** END 'INPUT1' DATA BASE
0014  ** START 'INPUT2' DATA BASE
0015      IZ= 00,Z= 185.0,XMJD= 0.0,F10= 100.0,F10B= 100.0,G1= 00.0
0016      IYR=1968,MN=06,IDA=20,IHR=12,MIN=00
0017      ITEMP= 01,IXN2= 01,I02= 01,I0= 01,IA= 01,IHE= 01,IH= 01,IEM= 01
0018      IDEN= 01,IDLOG= 01
0019  ** END 'INPUT2' DATA BASE
```

APPENDIX E

TRANSFER FILES

\JAC70 T=00004 IS ON CR00037 USING 00004 BLKS R=0000

```
0001 :*****
0002 :* \JAC70 -- REPLACES THE JACCHIA 'JAC70' PROGRAM **
0003 :* EXECUTES THE JACCHIA 'JAC70' PROGRAM **
0004 :* REMOVES THE JACCHIA 'JAC70' PROGRAM **
0005 :*****
0006 :LL,1
0007 :RP,JAC70
0008 :* &dcJAC70 ID SEGMENT HAS BEEN REPLACED!!!&d0 *
0009 :RU,JAC70
0010 :* &dcJAC70 PROGRAM IS NOW RUNNING!!!&d0 *
0011 :OF,JAC70
0012 :* &dcJAC70 ID SEGMENT HAS BEEN REMOVED!!!&d0 *
0013 :||
```

\CLJ70 T=00004 IS ON CR00037 USING 00004 BLKS R=0000

```
0001  ;*****
0002  ;** \CLJ70 -- COMPILES & LOADS THE JAC70 PROGRAM, **
0003  ;** THE TYPE 6 LOAD MODULES IS THEN SAVED **
0004  ;** (<ISP,JAC70:137> ON THE JACCHIA DISC **
0005  ;** <LUN37>. **
0006  ;** **
0007  ;** TO RUN -- ENTER :;\CLJ70,LL <LL --LIST DEVICE> **
0008  ;*****
0009  ;LL,1
0010  ;* &dcJAC70 IS NOW BEING COMPILED & LOADED!!!&dc *
0011  ;OF,JAC70
0012  ;PU,JAC70:137
0013  ;RU,FTN4X,&JAC70:137,1G,%JAC70:137:1-1
0014  ;RU,LOADR,"JAC70,,1G
0015  ;PU,%JAC70:137
0016  ;SP,JAC70:137
0017  ;* &dcJAC70 PROGRAM IS NOW READY TO RUN!!!&dc *
0018  ;;
```

\JAC71 T=00004 IS ON CR00037 USING 00004 BLKS R=0000

```
0001 ;*****
0002 ;* \JAC71 -- REPLACES THE JACCHIA 'JAC71' PROGRAM **
0003 ;* EXECUTES THE JACCHIA 'JAC71' PROGRAM **
0004 ;* REMOVES THE JACCHIA 'JAC71' PROGRAM **
0005 ;*****
0006 ILL,1
0007 IRP,JAC71
0008 ;* %dCJAC71 ID SEGMENT HAS BEEN REPLACED!!!%d0 *
0009 IRU,JAC71
0010 ;* %dCJAC71 PROGRAM IS NOW RUNNING!!!%d0 *
0011 IOF,JAC71
0012 ;* %dCJAC71 ID SEGMENT HAS BEEN REMOVED!!!%d0 *
0013 II
```

\SCLJ71 T-00004 16 ON CR00037 USING 00004 BLKS R-0000

```
0001 ;*****
0002 ;** \SCLJ71 -- COMPILES & LOADS THE JAC71 PROGRAM. **
0003 ;**          THE TYPE 6 LOAD MODULES IS THEN SAVED **
0004 ;**          (<1SP,JAC71:137>) ON THE JACCHIA DISC **
0005 ;**          (<LU#37>). **
0006 ;** **
0007 ;** TO RUN -- ENTER :;\SCLJ71,LL (<LL --LIST DEVICE>) **
0008 ;*****
0009 ;LL,1
0010 ;* &dCJAC71 IS NOW BEING COMPILED & LOADED!!!&d0 *
0011 ;OF,JAC71
0012 ;PU,JAC71:137
0013 ;RU,FTN4X,&JAC71:137,1G,%JAC71:137:1-1
0014 ;RU,LOADR,^JAC71,,1G
0015 ;PU,%JAC71:137
0016 ;SP,JAC71:137
0017 ;* &dCJAC71 PROGRAM IS NOW READY TO RUN!!!&d0 *
0018 ;;
```

5JPL0T T=00004 IS ON CR00037 USING 00004 BLKS R=0000

```
0001 :*****
0002 :* 5JPL0T -- REPLACES THE JACCHIA 'JPL0T' PROGRAM **
0003 :* EXECUTES THE JACCHIA 'JPL0T' PROGRAM **
0004 :* REMOVES THE JACCHIA 'JPL0T' PROGRAM **
0005 :*****
0006 :LL,1
0007 :RP,JPL0T
0008 :* %dCJPL0T ID SEGMENT HAS BEEN REPLACED!!!%d0 *
0009 :RU,JPL0T
0010 :* %dCJPL0T PROGRAM IS NOW RUNNING!!!%d0 *
0011 :OF,JPL0T
0012 :* %dCJPL0T ID SEGMENT HAS BEEN REMOVED!!!%d0 *
0013 ::
```


\CLJPL T=00004 IS ON CR00037 USING 00004 ELKS R=0000

```
0001  ;*****
0002  ;** \CLJPL -- COMPILES & LOADS THE JPLOT PROGRAM, **
0003  ;**          THE TYPE 6 LOAD MODULES IS THEN SAVED **
0004  ;**          (<ISP,JPLOT:137>) ON THE JACCHIA DISC **
0005  ;**          <LUN37>. **
0006  ;** **
0007  ;** TO RUN -- ENTER :1\CLJPL,LL (LL --LIST DEVICE) **
0008  ;*****
0009  ;LL,1
0010  ;* %&dcJPLOT IS NOW BEING COMPILED & LOADED!!!%&dc *
0011  ;OF,JPLOT
0012  ;PU,JPLOT:137
0013  ;RU,FTN4X,%JPLOT:137,1G,%JPLOT:137:1-1
0014  ;RU,LOADR,"JPLOT,,1G
0015  ;PU,%JPLOT:137
0016  ;SP,JPLOT:137
0017  ;* %&dcJPLOT PROGRAM IS NOW READY TO RUN!!!%&dc *
0018  ;;
```